EH-201/L User manual

Heating regulator

OUMAN EH-201/L is a new generation heating regulator. Its versatility, intelligence and clarity have made it an ideal heating regulator for all kinds of water circulation heating systems.

In addition to heating regulation, EH-201/L has a number of other control and alarm functions of buildings' technical systems. Measurement information can be read, settings and controls can be checked and adjusted, and alarms can be received and acknowledged via a GSM telephone's text messages.

EH-203 gives its user instructions on a display.

Types of heating systems:

- Radiator heating
- Floor heating
- Air conditioning
- preregulation

PATENTED GSM CONTROL

LONWORKS®

MODBUS ®

Types of heating production:

- District heating exchangers
- Boiler plants
- Accumulators
- District heating substations

Locations:

- Apartment buildings and row houses
- Business premises and office buildings
- Private homes and summer cabins

OUMAN®

OUMAN EH-201/L

FOR STARTERS

Congratulations on your excellent choice! You have arquired a diverse new generation heating regulator designed for residental and office buildings - most a top - of - the - line product which can be adapted to the most diverse locations and heating systems.

Next we will introduce the regulator and the basic principles for using the user manual.

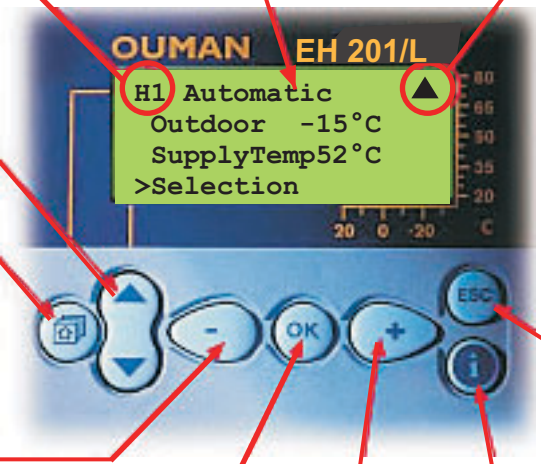
User panel

Regulating circuit code indicates that this is one circuit heating regulator.

Browse button - moves the > cursor up and down.

Group select button - not in use in Ouman EH-201/L

The example shows the regulating circuit's operating mode.



Symbols which indicate actuator control mode.

- Regulator opens the 3-point controlled actuator.
- Regulator closes the 3-point controlled actuator.
- Height up the pillar shows the position of he voltage controlled actuator.
- Valve is fully open (100%) and the control voltage is 10 V.
- Valve is fully closed (0%) and the control voltage is 0 V or 2 V (2 ... 10 V actuator).

Decrease button

OK button

Increase -button

ESC press to return to the previous display

INFO-button -gives operating instructions and additional information on the display in different situations.

HINT! When you press + button in adjoining basic display mode, the regulator displays all the measurement results in turn and then returns to the basic display mode.

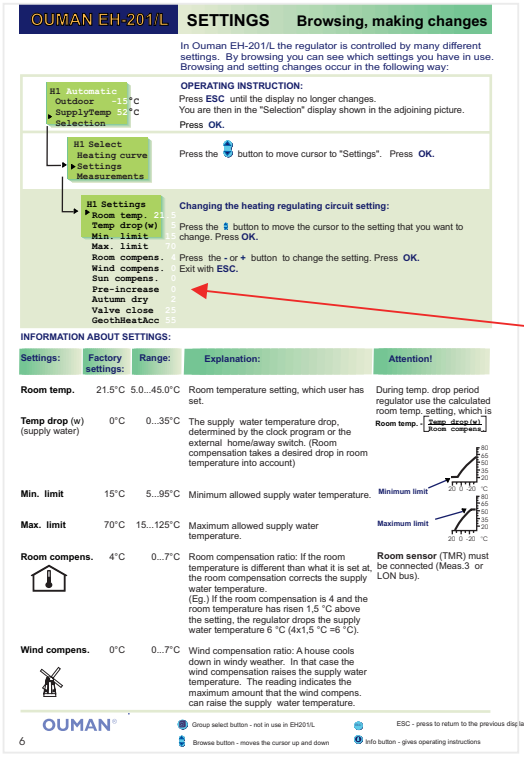
Reading the page:

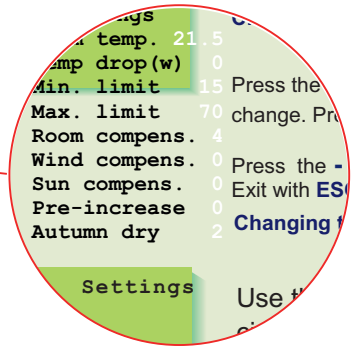
Rate from the basic display to the topic of the page.

The colored section presents the actual topic.

Additional information about the topic in question.

Condensed guide for the buttons.





Settings that can be changed are marked on the page in **white**.

CONTENTS

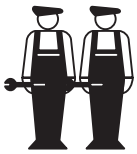
User guide

Page

Maintenance guide

These pages contain directions for maintenance persons authorized by Ouman. Access to the regulator's maintenance mode is prevented by a maintenance mode.

Special maintenance



OUMAN

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Voimatie 6, FIN-90440 Kempele Finland
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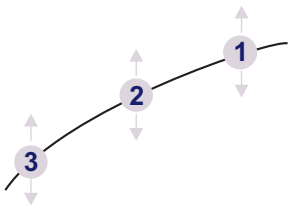
ouman.fi

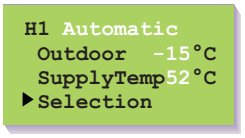
SETTINGS FOR HEATING CURVE



The basis for an even room temperature is a characteristic heating curve of just the right shape. The right shape for a characteristic heating curve depends on many factors.
In Ouman EH-201/L the characteristic heating curve can be adapted to exactly meet the needs of the facility from three points;

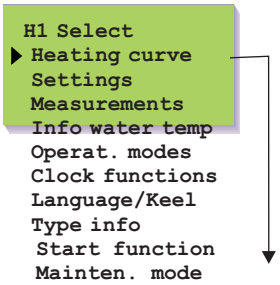
1. outdoor temperature of -20 °C
2. outdoor temperature of 0 °C
3. outdoor temperature of +20 °C

EH-201/L prevents the setting of an ncorrectly shaped characteristic heating curve. It automatically suggests an adjustment.

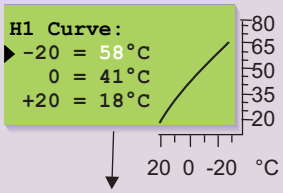


OPERATING INSTRUCTION:

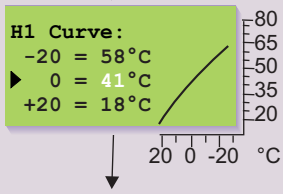
Press **ESC** until the display no longer changes.
You are then in the "Selection" display shown in the adjoining picture.
Press **OK.**



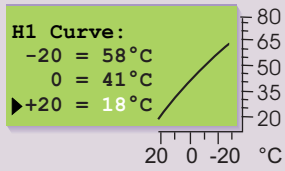
Press the button to move cursor to "Heating curve"
Press **OK.**



Press **OK.**
Press the **-** or **+** button to set the supply water temperature at an outdoor temperature of -20 °C.
Press **OK.**

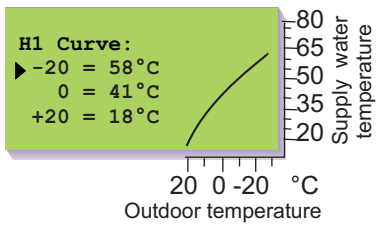


Press **OK.**
Press the **-** or **+** button to set the supply water temperature at an outdoor temperature of 0 °C.
Press **OK.**



Press **OK.**
Press the **-** or **+** button to set the supply water temperature at an outdoor temperature of -20 °C.
Press **OK.**
Exit with **ESC.**

CURVE INTERPRETATION:



When the outdoor temp. is:
-20 °C, the supply water is +58 °C
0 °C, the supply water is +41 °C
+20 °C, the supply water is +18 °C

Attention!

The temperature of the supply water may vary from the curve if a reduced operation mode, room, wind or sun compensation has been connected to the regulator or if one of the limiting functions limits the temperature (see p. 10).
If the outdoor sensor is disconnected or if the sensor is broken, the regulator assumes that the outdoo temperature is 0 °C (use during construction without the outdoor sensor).

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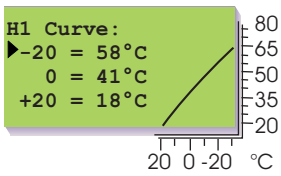
Group select button - not in use in EH-201/L
Browse button - moves the cursor up and down
ESC - press to return to the previous display
Info button - gives operating instructions

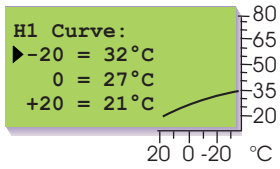
Instructions for setting the curve

EXAMPLES OF DIFFERENT HEATING SYSTEMS:

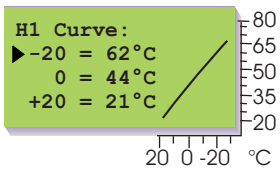
a) Normal radiator network (factory setting)



B) Floor heating



C) Preheating for air conditioning



INSTRUCTION:

If the room temperature drops in subzero weather, raise the curve setting at -20 °C.
If the room temperature rises in subzero weather, lower the curve setting at -20 °C.
If the room temp. feels chilly at zero degree weather, raise the curve setting at 0 °C.
In this way you can set the regulating curve to meet the heating needs of your facility.

ATTENTION!

Wait a sufficient amount of time after the adjustment so the change has time to effect the room temperature.

Surface mounted thermostat CO1A
AC 230V 15 (2,5) A

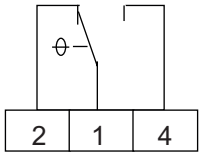
HOUSES WITH FLOOR HEATING:

Set the EH-201/L regulator's maximum limit between +35 ... +40 °C and the minimum limit between +20 ... +25 °C.

In floor heating solutions it is important to make sure that exessively hot water which could damage structures or surfaces doesn't ever get into the network. A mechanical thermostat should be installed on a supply water pipe which stops the circulation pump in case of overheating. Ouman Oy keeps CO1A surface mounted thermostats in stock that are suitable for this purpose. Set the thermostat at 40 ... 45 °C.

Model	Set point range °C	Differential range °C	Temp. of cover, °C
CO1A	+20...+90	8	-35...+120

Surface mounted thermostat's C01A connection:

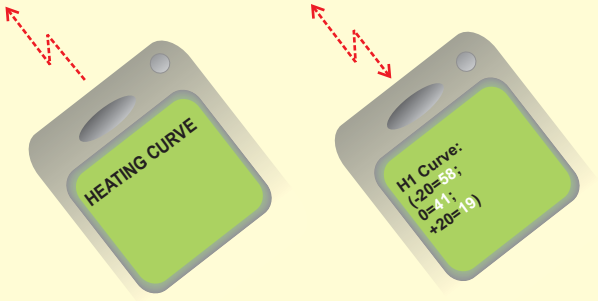


Pump control 230 VAC

Pump control

PATENTED GSM CONTROL

KEYWORD:
Heating curve



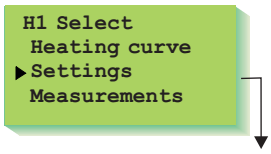
SETTINGS Browsing, making changes

In Ouman EH-201/L the regulator is controlled by many different settings. Settings are selected according to sensor connections and relay control modes (e.g., is a relay controlling the oil burner or pump or geothermal heating application or is the relay temperature controlled (see p. 26 -28). By browsing you can see which settings you have in use.
Browsing and setting changes occur in the following way:

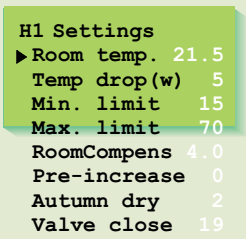
OPERATING INSTRUCTION:

Press **ESC** until the display no longer changes.
You are then in the "Selection" display shown in the adjoining picture.

Press **OK.**



Press the button to mov e cursor to "Settings". Press **OK.**



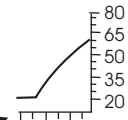
Changing the heating regulating c ircuit setting:

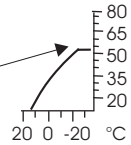
Press the button to move the cursor to the setting that you want to change. Press **OK.**

Press the **-** or **+** button to change the setting. Press **OK.**
Exit with **ESC.**

INFORMATION ABOUT SETTINGS:

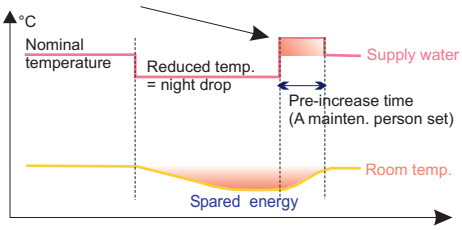
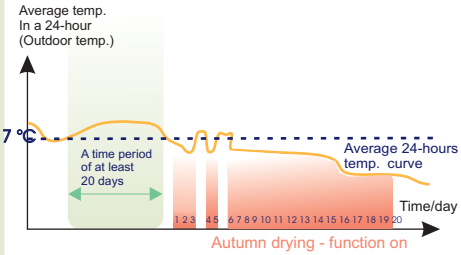
Settings:	Factory settings:	Range:	Explanation:	Attention!
Room temp.	21.5°C	5.0...45.0°C	Room temperature setting, which user has set.	During temp. drop period regulator use the calculated room temp. setting, which is **Room temp. -** Temp drop(w) / Room compens.
Temp drop (w) (supply water)	0°C	0...35°C	The supply water temperature drop, determined by the clock program or the external home / away switch. (Room compensation takes a desired drop in room temperature into account)	
Min. limit	15°C	5...95°C	Minimum allowed supply water temperature.	**Minimum limit**
Max. limit	70°C	15...125°C	Maximum allowed supply water temperature.	**Maximum limit**
Room compens.	4°C	0...7°C	Room compensation ratio: If the room temperature is different than what it is set at, the room compensation corrects the supply water temperature. (Eg.) If the room compensation is 4 and the room temperature has risen 1,5 °C above the setting, the regulator drops the supply water temperature 6 °C (4x1,5 °C =6 °C).	**Room sensor** (TMR) must be connected (Meas.3 or net).





Group select button - not in use in EH201/L
Browse button - moves the cursor up and down
ESC - press to return to the previous display
Info button - gives operating instructions

Additional information about settings

Settings:	Factory Settings	Range:	Explanation:	Attention!
Pre-increase 	0 °C	0...25 °C	The automatic pre-increase in degrees which occurs after a reduced operation (nighttime drop) The pre-increase makes it possible to raise the room temperature faster to a nominal room temperature (day temp.) after a reduced operation (see page 23).	A maintenance person must first set the length of the pre-increase time (see maintenance mode p 23).
Autumn dry 	2 °C	0...15 °C	In autumn, the temperature of the supply water is automatically raised for 20 days through autumn drying. Autumn drying is activated when the average temperature in a 24-hour period has continually been above 7 °C for a period of at least 20 days and after this drops below 7 °C. Autumn drying is activated during the next 20 days whenever the average temperature in a 24-hour period is under 7 °C. The autumn drying setting indicates how much autumn drying raises the supply water temperature. The original factory setting is 2 °C.	
Valve close	19 °C	5...50 °C	Valve closed during the summer: The outdoor temp. limit at which the regulator closes the valve. If the mainten. person has selected "H1 Valve regul" under pump summer stop, the function is not on in that particular circuit. Select "H1 Valve close" in pump summer stop for that function to be on (see p. 26). The factory setting is hat the alve is closed.	If pump summer stop has been selected for relay 1's control function, this setting becomes the pump's summer stop limit.

WIND AND SUN COMPENSATION:

Settings:	Factory Settings	Range:	Explanation:	Attention!
Wind compens. 	0°C	0...7°C	Wind compensation ratio: A house cools down in windy weather. In that case the wind compensation raises the supply water temperature. The reading indicates the maximum amount that the wind compensation can raise the supply water temperature.	**Wind sensor** must be connected (Meas.3 or net).
Sun compens. 	0 °C	0...-7 °C	The room temperature of a house having large windows with a south exposure rises on a sunny day even in subzero weather. The reading indicates the maximum amount that the sun compensation can drop the supply water temperature.	**Sun sensor** must be connected (Meas.3 or net).

Additional information about settings

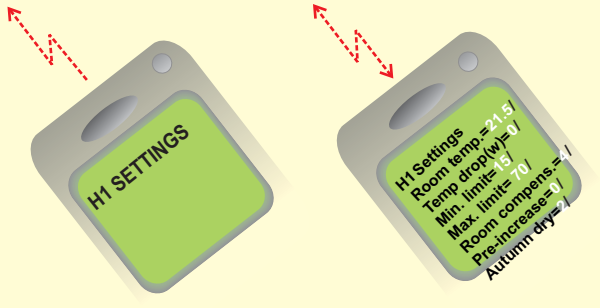
SETTINGS ACCORDING TO RELAY CONTROL MODES (see pages 26 - 28)

Settings:	Factory Settings:	Range:	Explanation:	Attention!
Burner ON	70 °C	5...95 °C	When the temperature of measurement 10 drops to the set limit, the regulator causes relay 1 to turn the burner on (see p. 26).	Select relay 1 for burner control.
El.Heater ON	50 °C	5...95 °C	When the temperature of measurement 10 drops to the set limit, the regulator causes relay 2 to switch on the heating resistor (p. 28)	Select relay 2 for heating resistor control.
Pump stop	19 °C	5...50 °C	Pump summer stop: Outdoor temperature at which the regulator stops the pump. During connection and installation, the maintenance person decides whether to stop the circuit pump and whether the valve will continue regulating or whether it will close (see mainten. mode page 26).	Pump stop appears in place of the valve summer close setting if pump summer stop has been selected in the relay 1 control mode.
Geothermal heating accumulator's temp. *"GeothHeatAcc"*	55°C	5...55°C	During full effect geothermal heating the regulator controls the compressor or the heating resistor according to the accumulator temperature set by the user.	The setting appears if "GeothHeatFull" has been selected in "Relay 1 control" selection (p. 26).
Geothermal heating accumulator's upper part temp. *"GeothH.UpPart"*	55°C	5...75 °C	During limited effect geothermal heating the regulator controls the compressor and heating resistor according to the accumulator upper part temperature set by the user. The regulator also controls the compressor according to the temperature needed in the heating network.	The settings appear if "GeothHeatPart" has been selected in "Relay 1 control" selection (p. 26)
Geothermal heating accumulator's lower part min temp. *"GeothH.LowMin"*	35°C	30...55 °C	When the temperature of accumulator lower part drops to this min. limit the regulator switched the compressor on during limited effect geothermal heating.	
Relay 1 temperat. limit *"R1 temp lim."*	55°C	0...100 °C	Temperature of measurement 11 when relay 1 is to be activated.	The function is taken into use in the maintenance mode, in the relay 1 control mode (p. 26).

PATENTED GSM CONTROL

KEYWORDS:

H1 Settings



Group select button - not in use in EH201/L

Browse button - moves the cursor up and down

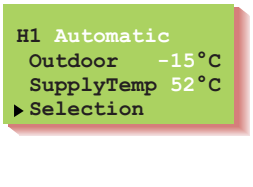
ESC - press to return to the previous display

Info button - gives operating instructions

MEASUREMENTS Labeling

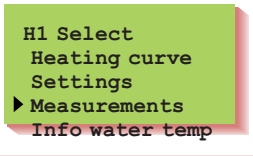
The regulator can be connected to 9 different measurement data at the same time (7 NTC measurements + 2 digital inputs). Measurement data can also be read through the net. Also the position of the voltage controlled (0...10V or 2...10V) actuator can be seen. Measurements 3, 9, 10, and 11 can be used to indicate external alarms (additional information on alarms page 19).

ATTENTION! **Only the measurements connected to the regulator appear on the display.**

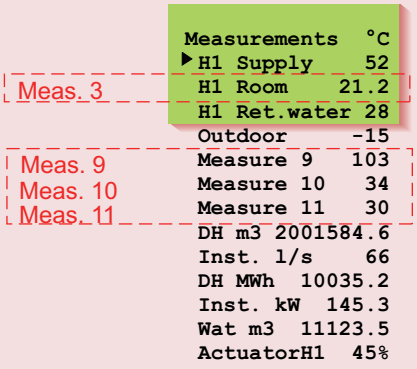


OPERATING INSTRUCTION:

Press **ESC** until the display no longer changes.
You are then in the "Selection" display shown in the adjoining picture.
When you press the **+** button in the basic display mode, the regulator displays all the measurement results in turn and then returns to the basic display mode.
You can also browse measurement data in the "Measurements" display.
Press **OK.**



Press the button to move cursor to "Measurements". Press **OK.**



Browsing through measurements:

Press the button to browse different measurements.
Press **ESC** to exit from the measurements display.

Every sensor has it's own typical range. (Eg. outdoor sensor 50...+ 50 °C). If the sensor's measured value is outside of this range, a - or + character will appear on the measurements display in place of the sensor's measured value to indicate whether the value is above or below the range.

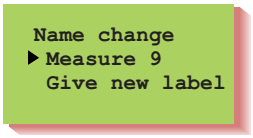
If there is a sensor defect the regulator gives an alarm (see p. 19) and "err" will appear in place of the measured value.

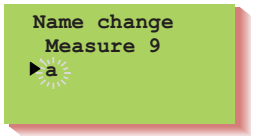
Measurement 3: If a sensor is connected to measurement 3, the regulator assumes that it is a room compensation sensor and labels it H1 room (factory setting). To change its use to [wind or sun compensation or a temperature measurement that can be freely labeled (measurement 3)], see page 31.

Measurements 9, 10 and 11: The regulator automatically reserves measurements 9, 10 and 11 for certain uses if a geothermal heating application or oil burner control or temperature controlled relay has been selected to control relay 1. (see p. 26 - 28.) If measurements 3, 9, 10 and 11 are used as free temperature measurements, they can be labeled through text editing for other uses, e.g., cooler, accumulator upper, accumulator lower, etc.

Relabeling measurements 9, 10 and 11:

Move the cursor to the measurement (9, 10 or 11) that has to be relabeled. Press **OK.**



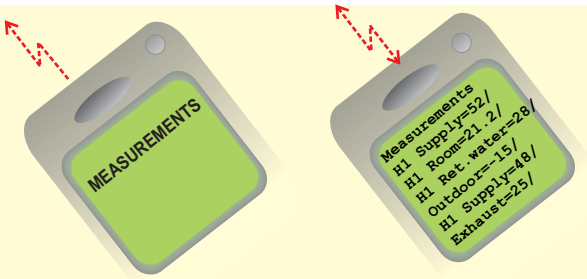


Move the cursor to "Give new label". Press **OK.** A letter "a" appears on the display. You can move forward or backward in the character row by pressing the **+** or **-** button. Confirm the letter / character by pressing **OK**, then the same letter / character that you selected will blink in the next space. The character that has been fed last can be deleted by pressing **ESC**. If you press the **ESC** button for a while you can delete the new name and the previous name remains in effect. When you have written the name, press **OK** for a while (over 2 sec.), to exit from the data entry mode and the name that has been written will come into effect.

Text editor's characters in the order in which hey appear:
"Empty" . - numbers 0 ... 9 letters: A ... Z and a ... z ä ö å

PATENTED GSM CONTROL

KEYWORD:
Measurements

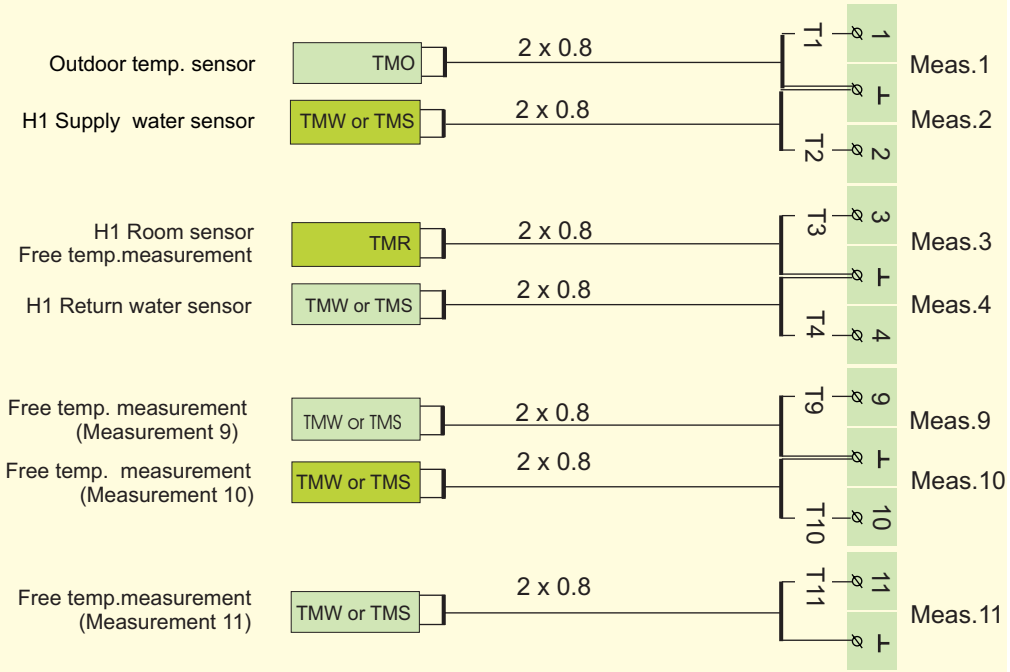


Group select button - not in use in EH2(..2
Browse button - moves the cursor up and down
ESC - press to return to the previous display
Info button - gives operating instructions

MEASUREMENTS Additional information

Strip con-nector	Measure-ment:	Measurement information:	Setting range:	Attention!
1	Out temp	Outdoor temperature	-50...+50	
2	H1 Supply	Supply water temperature in regulating circuit H1	0...+130	Can be read through the net
3	H1 Room	Room temp. in regulating circuit H1 (room comp.)	0...+60	Interchangeable (p. 29). If several compensations are needed, the data must be read through the net and the wind is m/s and the light is lux (p. 34).
3	Wind	Wind speed (% of sensor's range)		
3	Sun	Amount of light (% of sensor's range)		
3	Meas. 3	Free measurement, information type measure-ment which can be relabeled through text editing.		
4	H1 Ret.water	Return water temperature in regulating circuit H1	0...+130	
9	Meas. 9	Free measurement; name using the text editor	0...+130	
10	Meas. 10	Free measurement; name using the text editor	0...+130	
11	Meas. 11	Free measurement; name using the text editor	0...+130	
	DH m3	Measured consumption of DH water (m^3)	0...9999999.9	Measurement data through a digital input or the net.
	Inst. l/s	Momentary district heating water consumption (l/s)	0...+120	
	DH MWh	Measured energy consump. of DH water (MWh)	0...99999.9	
	Inst. KW	DH energy consumption in kW (5 min. period)	0...3276.7	
	Wat m3	Measured water consumption of facility (m^3)	0...99999.9	
	ActuatorH1	Actuator position in regulating circuit H1		Appears only when using a 0...10V (2...10V) controlled

INSTRUCTIONS FOR CONNECTING SENSORS:



Resistance value table

°C	Ω
-30	177 100
-25	130 400
-20	96 890
-15	72 830
-10	55 340
-5	42 340
0	32 660
5	25 400
10	19 900
15	15 710
20	12 490
25	10 000
30	8 064
35	6 531
40	5 330
45	4 368
50	3 602
55	2 987
60	2 490
65	2 084
70	1 753
75	1 482
80	1 259
90	917
100	680
110	511

Putting sensor into use and removing it from use:

If the outdoor sensor is not connected, the regulator assumes that the outdoor temperature is 0°C and a sensor fault message appears on the display (Outdoor temp err). When the outdoor sensor is connected, the regulator automatically takes it into use. **After adding other sensors you must go to start function!** (See page 18)

Group select button - not in use in EH201/L

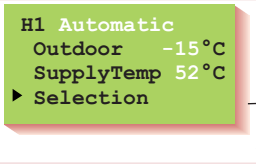
Browse button - moves the cursor up and down

ESC - press to return to the previous display

Info button - gives operating instructions

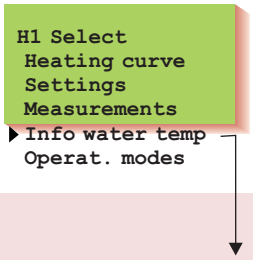
SUPPLY WATER INFORMATION

In this mode we can see which factors determined by the regulator make up the supply water temperature at the time of inspection. The basis for this is the supply water temperature at the present outdoor temperature according to the characteristic heating curve.



OPERATING INSTRUCTION:

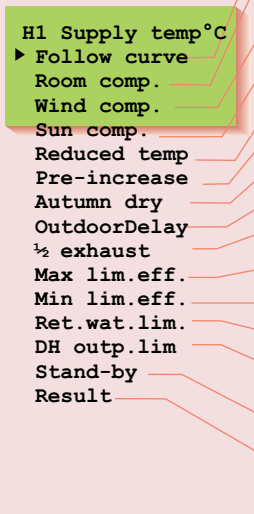
Press **ESC** until the display no longer changes.
You are then in the "Selection" display shown in the adjoining picture.
Press **OK.**



Press the button to move cursor to "Info water temp". Press **OK.**

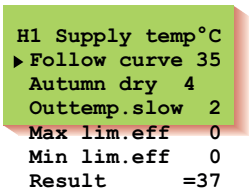
Press the button to browse factors which determine the supply water temperature.

Exit with **ESC.**



- Follow curve: Supply water temp. at the present outdoor temp. accord. to the curve
- Room comp.: Effect of room compensation on supply water/ RoomCompNigh: Effect of room compensation on supply water during reduced operation.
- Wind comp.: Effect of wind compensation on supply water
- Sun comp.: Effect of sun compensation on supply water
- Reduced temp: Effect of clock controlled reduced operation mode on supply water (or a drop controlled by a home/away switch or GSM phone)
- Pre-increase: Effect of pre-increase on supply water after reduced operation mode.
- Autumn dry: Effect of automatic autumn drying on supply water
- OutdoorDelay: Effect of outdoor temp. measurement delay on supply water
- ½ exhaust: Effect of exhaust fan at ½ power on supply water
- Max lim.eff.: Supply water temperature drop due to maximum limit
- Min lim.eff.: Supply water temperature increase due to minimum limit
- Ret.wat.lim.: Effect of return water limits on supply water
- DH outp.lim: Effect of district heat power limit or flow limit on supply water
- Stand-by: Effect of free temperature drop on supply water
- Result: Present supply water temperature (C°) determined by the regulator

EXAMPLE

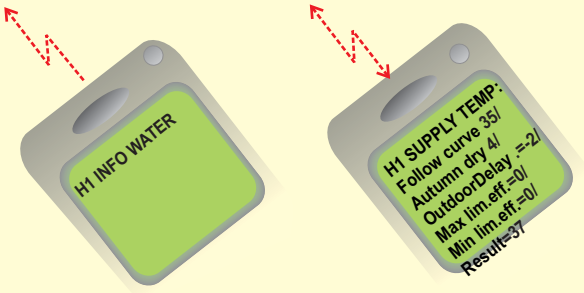


In the example, the supply water temperature according to the curve is 35 °C. Autumn drying raises it 4 °C. The outdoor temperature measurement delay drops the supply water temp. 2 °C. As a result, the regulator determines that the supply water temperature is +37 °C. (35+4-2=37).

PATENTED GSM CONTROL

KEYWORD:

H1 Info water



Group select button - not in use in EH201/L

Browse button - moves the cursor up and down

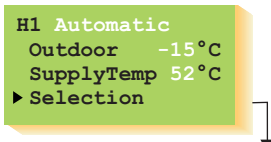
ESC - press to return to the previous display

Info button - gives operating instructions

OPERATING MODES

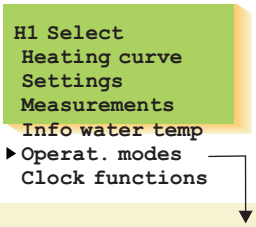
Ouman EH-201/L can be controlled with the operating modes mentioned below. The factory set automatic regulation is a normal regulating situation in which the clock controlled temperature drops are also possible.

The selected operating mode always appears on the basic display on the top line.

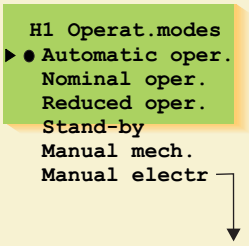


OPERATING INSTRUCTION:

Press **ESC** until the display no longer changes.
You are then in the "Selection" display shown in the adjoining picture.
Press **OK.**



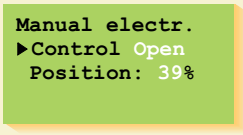
Press the button to move cursor to "Operat. modes". Press **OK.**



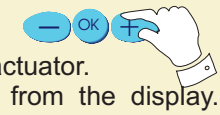
Press the button to browse operating modes.
The ● character indicates which operating mode has been selected.

Changing operating mode:
Move the cursor to the operating mode that you want. Press **OK.**
Exit with **ESC.**

Manual operation of actuator mechanically:
No electricity to actuator.
Only mechanical manual operation of actuator is possible.

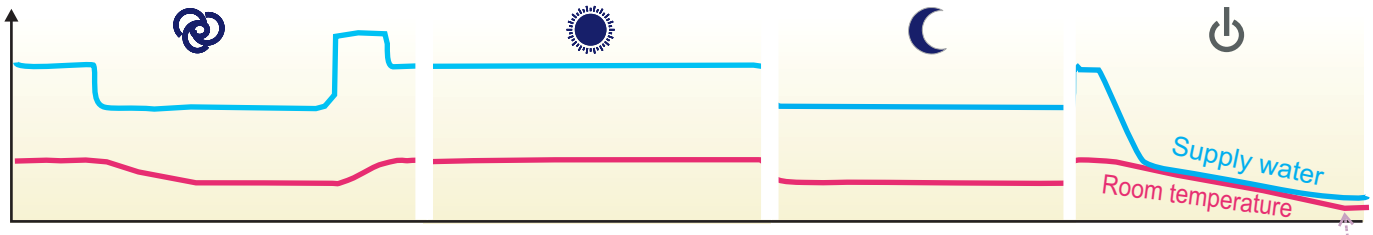


Manual operation of actuator electrically: Press **OK.**



Press the **-** or **+** button to change the position of the actuator.
The direction the actuator is being run can be seen from the display.
The position's % -reading indicates the actuator`s position if a voltage controlled 0...10V or 2...10V actuator (0% = closed, 100% = open) is being used. Confirm the actuator position by pressing **OK.**

The valve can also be connected so that 100% is closed.



Automatic control:
Temperature drops occur according to the clock program.

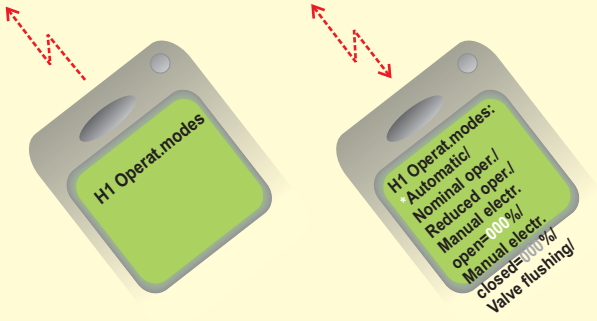
Nominal operat. mode:
The regulator keeps a nominal temperature on disregarding the clock program.

Reduced operat. mode:
Continuous reduced temperature (nighttime drop) is on regardless of the clock program.

Stand-by:
Free supply water temperature drop down to the freeze protect limit (stand- by function).

PATENTED GSM CONTROL

KEYWORD:
H1 Operat.mode



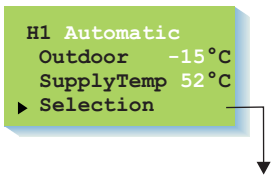
Group select button - not in use in EH201/L

Browse button - moves the cursor up and down

ESC - press to return to the previous display

Info button - gives operating instructions

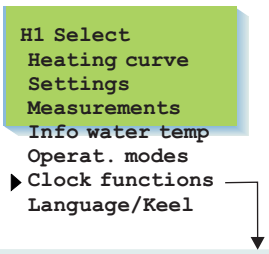
Setting the time happens in the following manner:



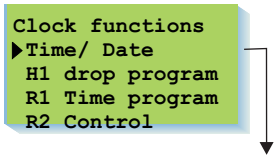
OPERATING INSTRUCTION:

Press **ESC** until the display no longer changes.
You are then in the "Selection" display shown in the adjoining picture.

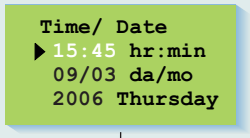
Press **OK.**



Press the ⇕ button to move cursor to “Clock functions”. Press **OK.**



The cursor is at "Time/Date". Press **OK.**

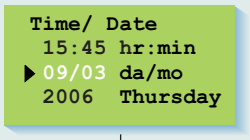


Set the time:

The cursor is at time. Press **OK.**

The hours blink. Press the **-** or **+** button to set the hours. Press **OK.**

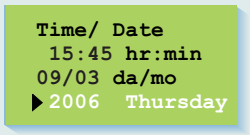
The minutes blink. Press the **-** or **+** button to set the minutes. Press **OK.**



Set the date: Press **OK.**

The day blinks. Press the **-** or **+** button to set the day. Press **OK.**

The month blinks. Press the **-** or **+** button to set the month. Press **OK.**



Set the year and weekday: Press **OK.**

The year blinks. Press the **-** or **+** button to set the year. Press **OK.**

The weekday blinks. Use the **-** or **+** button to set the weekday. Press **OK.**

Exit with **ESC.**

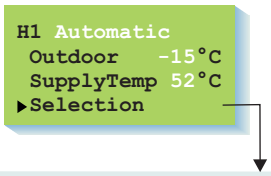
Attention!

The Ouman EH-201/L regulator's clock registers summer time and standard time changes and leap years.
The battery lasts approx. 10 years.

Clock programs - browsing, adding, deleting

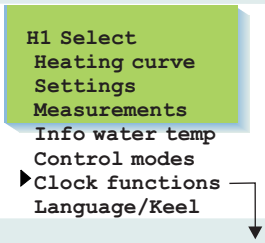
With the freely programmable 24 hour/7 day clock you can:

1. **Drop the temperature for certain lengths of time**
2. **Time control the desired on/off connections with two relays (eg. ventilator, outdoor lights, sauna stove, outside doors, see p. 24-26).**

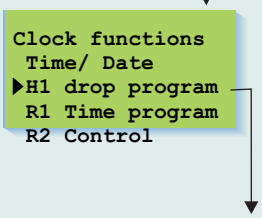


OPERATING INSTRUCTION:

Press **ESC** until the display no longer changes.
You are then in the "Selection" display shown in the adjoining picture.
Press **OK.**



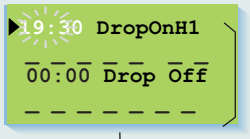
Press the ⇕ button to move cursor to "Clock functions". Press **OK.**



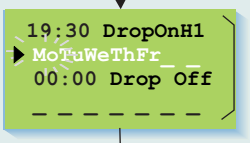
Press the ⇕ button to move cursor to the program (H1 drop program or relay control programs) whose time controls you want to access (browse, add or delete). Press **OK.**

Browse/ location for additional programming:

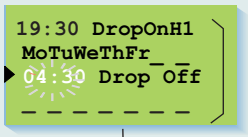
Press the ⇕ button to browse the clock programs which have been made. If you want to make additional programs, move cursor to first empty program block.



Set the start time for the temperature drop program: Press **OK.**
Temperature drop start time hours blink.
Press the **-** or **+** button to set hours. Press **OK.**
Minutes blink. Press the **-** or **+** button to set minutes. Press **OK.**

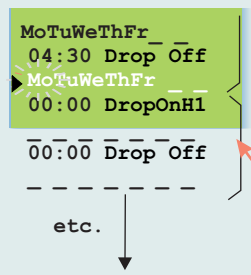


Set the weekdays (when the start time is effective):
Press the **-** or **+** button to select weekday.
The day is left unselected / press the **-** -button to delete the selection.
The selection shown on the display is taken into use with the **OK** button.
Make your selection for each day and press **OK.**



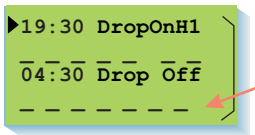
Set the end time for the temperature drop program: Press **OK.**
Hours blink. Press the **-** or **+** button to set hours. Press **OK.**
Minutes blink. Press the **-** or **+** button to set minutes. Press **OK.**

Set the weekdays (when the end time is effective):
Press the **+** button to select weekday.
The day is left unselected/ press the **-** to delete the selection.
The selection shown on the display is taken into use with the **OK** button.
Make your selection for each day and press **OK.**



There is always one program block inside the brackets (drop on and off).
The cursor moves to the beginning of the next program block (new brackets).
Continue programming as before or exit with **ESC.**

In the example the drop is in effect during the workweek between 19:30 and 4:30. On the weekend the drop begins on Friday evening at 19:30 and ends on Monday morning at 4:30.



DELETING THE PROGRAM BLOCK:

You can delete the program block inside the brackets by deleting the weekdays in that program block with the **-** button.

Group select button - not in use in EH201/L

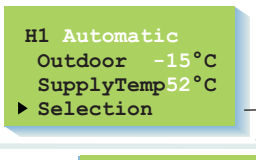
Browse button - moves the cursor up and down

ESC - press to return to the previous display

Info button - gives operating instructions

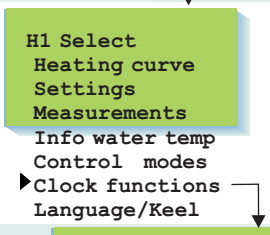
Clock functions; relay control

Relays can control many different functions, e.g., sauna stoves, locking doors etc. Relay clock functions are taken into use and labeled according to use in the relay control mode. (see p. 26 - 28). Then the relay can be controlled using a GSM, if a GSM has been installed into the regulator (optional equipment).

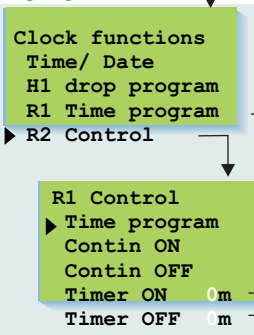


OPERATING INSTRUCTION:

Press **ESC** until the display no longer changes.
You are then in the "Selection" display shown in the adjoining picture.
Press **OK.**



Press the button to move cursor to "Clock functions". Press **OK.**



Press the button to move cursor to indicate the relay control (R1 or R2) whose controls you want to access. Press **OK.**

If the relay reserved for time control has been labeled, R1 (R2) it will indicate what the relay is reserved for (e.g., sauna, outside doors)

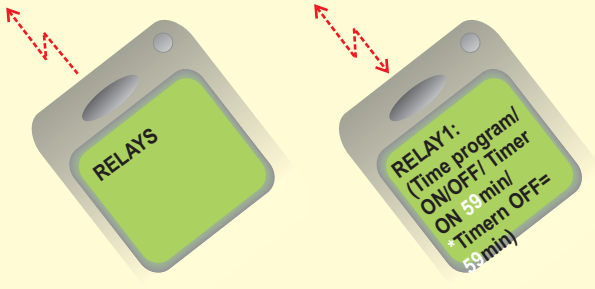
Set the time for the relay to be activated and the days of the week for the relay to be activated. In addition, set the time for the relay to be inactivated and the days of the week for the relay to be inactivated.

Press the **-** or **+** button and confirm the time on the timer by pressing **OK**.

Time program:	The relay can be used to switch an electric apparatus on and off at desired times. When the time program is in the "ON" mode the relay is activated. In this mode the time (time and weekday) is set for the relay to be activated and the time (time and weekday) is set for the relay to be inactivated. Time programming is done in the same way as L1 drop program time programming (see prev. p.). The regulator can be programmed for a maximum of 7 program series (on/off series) per relay.
Continuous ON:	The relay's time program is not in use. The relay is in a forced ON mode (= relay is activated).
Continuous OFF	The relay is in a forced Off mode (= relay is inactivated).
Timer ON	The relay's time program is temporarily replaced by a timer. The relay is in the ON mode (= activated) for a set time (range 0…999min), after which the relay switches to a time programmed mode. Press the or + button to change the time on the timer. The amount of time left on the timer appears on the display.
Timer OFF	The relay's time program is temporarily replaced by a timer. The relay is in the OFF mode (= is inactivated) for a set time (range 0…999min), after which the relay switches to a time programmed mode. Press the or + button to change the time on the timer. The amount of time left on the timer appears on the display.

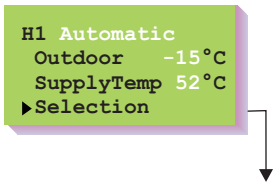
PATENTED GSM CONTROL

KEYWORD:
Relays



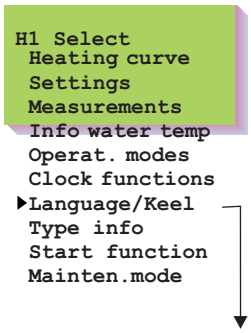
LANGUAGE/ KEEL

The Ouman EH-201/L regulator is in two languages. The regulator has the most commonly used languages, Finnish - Swedish and English-Eesti. The language of the regulator can be changed in the following manner.

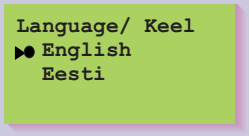


OPERATING INSTRUCTION:

Press **ESC** until the display no longer changes.
You are then in the "Selection" display shown in the adjoining picture.



Press the button to move cursor to "Language/Keel". Press **OK.**



Press the button to move the cursor to the language you want to use. Press **OK.**

Group select button - not in use in EH201/L

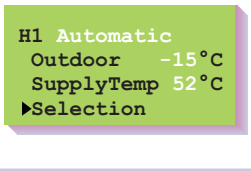
Browse button - moves the cursor up and down

ESC - press to return to the previous display

Info button - gives operating instructions

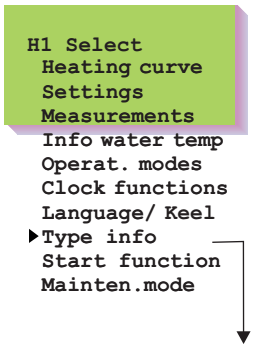
TYPE INFORMATION

Type information indicates which regulator is in question and which program version is in use. There is one heating circuit in the Ouman EH-201/L regulator.

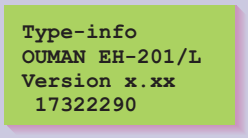


OPERATING INSTRUCTION:

Press **ESC** until the display no longer changes.
You are then in the "Selection" display shown in the adjoining picture.



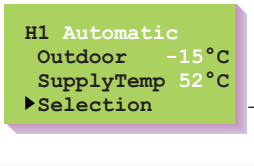
Press the button to move cursor to "Type info". Press **OK.**



Ouman Finland Oy invests strongly in continuous product development. The version number informs the producer which version is in question.

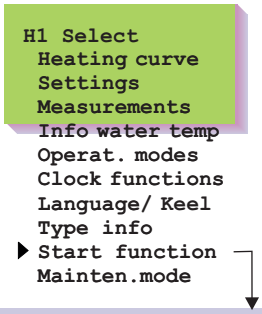
START FUNCTION Regulat. mode sel.

In the start function the regulator detects the sensors that are attached to it. The regulator takes the regulating circuit into use according to the supply water sensors. The assumption is that there is a basic regulator. It is possible to change to a self-learning regulator.
The start function also activates the sensor's fault alarms.
The basic regulator controls the supply water temperature according to the set heating curve.
The self-learning regulator automatically changes the characteristic heating curve according to the feedback from the room sensor. The self-learning maximum adjustment is 10%. The letter **i** on the heating curve display indicates that self-learning is in use.

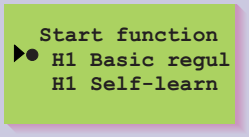


OPERATING INSTRUCTION:

Press **ESC** until the display no longer changes.
You are then in the "Selection" display shown in the adjoining picture.



Press the button to move cursor to "Start function". Press **OK.**



The regulator detects the sensors that are attached to it and shows possible regulating modes. The regulator's factory setting is a basic regulator.

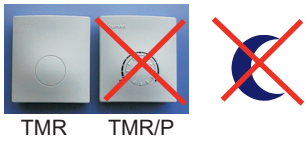
Browsing:

Press the button to browse the possible regulator types.
Exit with **ESC.**
The ● character indicates which regulator type has been selected.

Changing the regulator type:

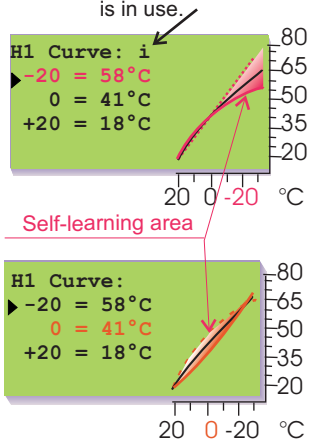
Press the button to move the cursor and press **OK.**

SELF-LEARNING INFORMATION:



TMR TMR/P

Indicates that self-learning is in use.



Self-learning occurs if the room temperature varies at least 1 °C from the set value when the outdoor temperature is in a +5... -5 °C or -15... -25 °C range for at least 4 hours.

Automatic adjustment of the characteristic heating curve occurs at 0 °C or -20 °C. The adjustment rate is 1 °C in 4 hours. The maximum adjustment of the set curve is +/- 10%. If the characteristic heating curve setting is changed from the keyboard or control room, self-learning starts from the beginning.

The room sensor (TMR) has to be in use in order for self-learning to take place. The self-learning setting must not be used if the room compensation unit (TMR/P) is in use. Self-learning does not function during a temperature drop.

Examples of self-learning function:

If the outdoor temperature is between -15... -25 °C, self-learning occurs at the characteristic heating curve's -20 °C setting. For example, if the setting value is 58 °C, the self-learning area is 52... 64 °C (+/- 10% of the set value). If the outdoor temperature is between -5... +5 °C, self-learning occurs at the characteristic heating curve's 0 °C setting. For example, if the setting value is 41 °C, the self-learning area is 37... 45 °C (+/- 10% of the set value).

Group select button - not in use in EH201/L
Browse button - moves the cursor up and down
ESC - press to return to the previous display
Info button - gives operating instructions

ALARMS!

EH-201/L gives as alarm when a situation deviates from the norm. In the event of an alarm, the regulator gives an alarm and a message appears on the display. In addition, the alarm relay contact closes. Note! Although the reason of the alarm is no more valid, the last alarm will remain into display intil it is acknowledged. If a GSM modem has been connected to the regulator, the alarm will appear in the desired GSM phone as a text message. External alarms can also be connected to EH-201/L, e.g., leakage, network's water pressure, etc. (alarm labeling is done using the text editor). If meas. 9 is reserved for exhaust measurement, the regulator gives an alarm if the exhaust temperature is too high or too low. (see p. 33)

ALARMS:

Sensor fault alarms:

```
Alarm!

Measurement 1
Outdoor temp err
```

In case of sensor fault, the regulator gives an alarm and a message appears on the display: Alarm! Measurement number and name and err. The alarm relay contact closes (strip connectors 31 and 32).

Risk of freezing alarm:

```
Risk of Freez!

Measurement 2
H1 supply  11
```

The regulator gives a risk of freezing alarm if the supply water temperat. goes below the lower limit set for a free drop in the supply water or the lower limit set for the room temperature. The present supply water temperature appears on the display. The alarm relay contact closes (strip connectors 31 and 32). See special maintenance settings page 30.

Deviation alarm:

```
Deviation alarm!

Measurement 2
H1 supply 25
```

The regulator gives a deviation alarm if the supply water temperature permanently deviates (factory setting 60 min) from the temp. set for it by the regulator. (The maximum allowed deviation is listed in special maintenance under "H1 dev. alarm" settings and the duration of the deviation that causes the alarm to go off is under settings "DevAlaDela", page 30.)

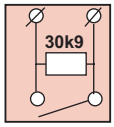
EXTERNAL ALARMS:

Measurements 3, 9, 10 and 11 as alarms:

"Order oil"
"Risk of moisture"
"Wastewater tank"
"Exhaust"

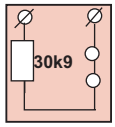
Measurements 3, 9, 10, and 11 can also be used to indicate external alarms (Potential free switch). In that case a 30k9 resistor must be connected to the strip connector of the measurement in question.

Closing alarm



When the contact is open "1" appears on the display. When the switch closes, an alarm goes off and the alarm in question appears on the display.

Opening alarm



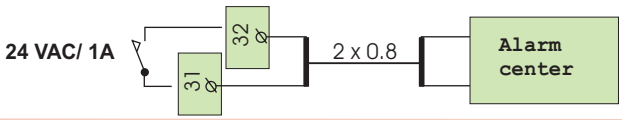
When the contact is closed "1" appears on the display. When the switch open, an alarm goes off and the alarm in question appears on the display.

Digital inputs as alarms

"Burglar alarm"
"Water pressure"

The regulator has 2 digital inputs which can be used when transferring an alarm if "Alarm Dig 1 (2)" has been selected in the Dig-selection. When the switch closes, an alarm goes off and "**err**" appears on the display. If an alarm has been labeled, the name of the alarm appears, for eg., when pump 1's thermal relay is triggered, "Heat. pump err" appears on the display. If the alarm is not labeled, "Alarm!, Dig 1 (2), Alarm Dig1(2)" will appear on the display. In the event of an alarm, the alarm relay contact closes (strip connectors 31 and 32).

CONNECTING THE ALARM RELAY:



ALARM ACKNOWLEDGEMENT:

Turn the alarm off by pressing any button. The display will return to the mode it was in before the fault appeared or if there are additional sensor faults their alarm information will appear on the display. If you don't press the keyboard in 20 seconds the alarm will return to the display if the fault has not been corrected.

PATENTED GSM CONTROL

The GSM modem (optional equipment) offers an economical "miniature monitor solution". Alarm information is directed to the desired GSM numbers (1 and 2). See p. 39). In the event of an alarm, the regulator first sends a text to GSM1 that indicates the cause of the alarm. The alarm is acknowledged when the same message is sent back to the regulator via the GSM. If the GSM1 does not acknowledge the alarm in 5 minutes, the regulator will send the text message again to both GSM numbers.

When a GSM modem is connected to EH-201/L, a GSM telephone can be used to communicate with the regulator via text messages (installation p 38). Almost all of the user level functions that are mentioned in this manual can be carried out using a GSM phone. These include measurements, settings, heating curve settings, supply water information and the regulator's operating mode. Clock programs can be bypassed permanently or for certain periods of time. Alarms are also directed to a GSM phone. They can be acknowledged by sending the alarm message back to the regulator.

COMMUNICATING WITH THE REGULATOR USING A GSM:

Send the following text message to the regulator: **KEYWORDS**

If the regulator has a device ID (p. 35,36), always write the device ID before the keyword (e.g., TC1 KEYWORDS). The regulator will send a list of keywords via text message, which will help you obtain information about how the regulator operates. Each keyword is separated by a / character.

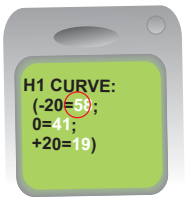
Receiving information from the regulator:

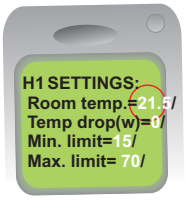
Send a text message to the regulator using keywords that it provides you. The regulator recognizes only one request at a time, so write only one keyword/message. You can write the keyword using capitals or small letters. (If the regulator has a device ID (see p. 38,39), write the device ID in front of the keyword.)

The regulator answers your request by sending the desired information.

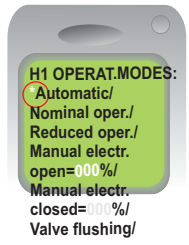
Operating the regulator using a GSM:

With the GSM phone you can adjust heating curve settings, user level settings, the regulator's operating mode, or time-controlled relay operation. Send the regulator a text message. Using keywords, request information about the function whose settings you want to adjust (or obtain the information from your telephone's memory). Adjust the settings in the text message that the regulator sent. Send a text message with the new settings to the regulator. The regulator will make the requested adjustments and acknowledge them by sending back a text message with the new settings.





Keywords:	Instruction for adjusting settings
Heating curves	Write the desired supply water temperature in place of the previous setting in the text message "adjust" mode.
H1 Setting	Write the setting in place of the previous setting
H1 Operat.modes	Put a star (*) in front of the operating mode which you want to start using. When you select manual operating, regulator sends information about the supply water temp. and valve positions (0-10V controlled actuators). Attention! When using electric manual control, special caution has to be taken because of danger of freezing and overheating. During the valve flush function, the regulator first opens and then closes the valve. After this automatic regulation continues. The purpose of this function is to clean out a plugged up valve.
Relays	A GSM can be used to control the relay only if the relay is being time controlled. Place a star (*) next to the control mode that you want to begin using. In time control you can also set the length of time it is in effect (range 0 …999 min).



Acknowledging alarms:

You can acknowledge an alarm with a GSM by sending the same message back to the regulator.

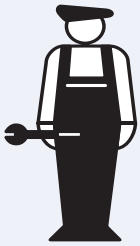
Group select button - not in use in EH201/L

Browse button - moves the cursor up and down

ESC - press to return to the previous display

Info button - gives operating instructions

ENTERING THE MAINTEN. MODE



The maintenance person's maintenance guide begins here (p. 21 - 44).

Access to the Ouman EH-201/L maintenance mode is prevented by user rights. Only those persons who have a maintenance code have access to the maintenance mode.

There are typical tuning values and settings in the **maintenance mode** which the maintenance person needs in conjunction with installation. An ordinary district heating exchanger is tuned in this mode.

Settings that are not needed as often can be done in the **special maintenance mode**, for ex., restoring origina factory settings, special settings, measurement 3 settings, digital input settings, LON and bus settings as well as modem settings and text message settings.

```
H1 Automatic
 Outdoor  -15 °C
 SupplyTemp 52°C
▸Selection
```

ENTERING THE MAINTENANCE MODE:

Press **ESC** until the display no longer changes.
You are then in the "Selection" display shown in the adjoining picture.

```
H1 Select
 Heating curve
 Settings
 Measurements
 Info water temp
 Operat. modes
 Clock functions
 Language/Keel
 Type info
 Start function
▸Mainten.mode
```

Press the button to move the cursor to "Mainten. mode".
Press **OK.**

```
H1 Maint mode
Enter maint code
▸0000
```

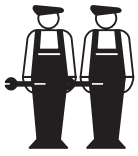
Press **OK.**
Press the **-** or **+** button to set the correct maintenance code one number at a time and press **OK** after each number.

MAINTENANCE MODE:

```
H1 Maint mode
▸Tuning values
 Settings
 Trends
 Actuator select
 Relay1 control
 Relay2 control
 Special mainten
```

Press the button to choose what you want to access from the adjoining menu. Each item is presented individually on a separate page.

SPECIAL MAINTENANCE MODE:



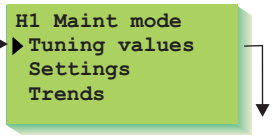
```
Special mainten.
▸Rstore settings
 Settings
 Meas. 3 setting
 Dig1 selection
 Dig2 selection
 LON initializ.
 Net measurement
 Text message
```

TUNING VALUES

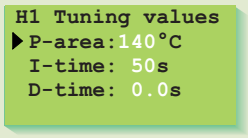
EH 201/L has PID regulator. The tuning values may have to be adjusted, for example, when the district heating exchanger is installed if the setting wavers with the original factory setting.

Directions for entering the maintenance mode are on page 21.

Tuning takes place in the following manner:



The cursor is at "Tuning values". Press **OK.**



Press the button to move the cursor. Press **OK.**
Press the **-** or **+** button to make changes. Press **OK** to confirm.

INFORMATION ABOUT TUNING VALUES

Settings:	Factory settings:	Range:	Explanation:	Attention!
P-area	140°C	10...300 °C	Supply water temperature change at which the actuator runs the valve at 100%.	Eg. If the supply water temper. changes 10 °C and the P area is 100 °C the position of the actuator changes 10%.
I-time	50 s	5...300 s	The deviation in the supply water temperature from the set value is corrected by P amount in I time.	
D-time	0.0 s	0.0...10.0 s	Regulation reaction speed up in the event of a temperature change.	Beware of constant waver!

The original factory settings may vary from the above.

Group select button - not in use in EH201/L
Browse button - moves the cursor up and down
ESC - press to return to the previous display
Info button - gives operating instructions

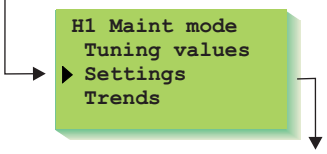
SETTINGS

Ouman EH-201/L has three types of settings:

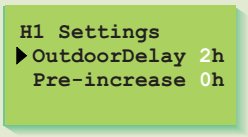
a) **user level settings** which the user can adjust (p. 6-8)
b) **maintenance mode settings** which the maintenance person may have to adjust
c) **special maintenance mode settings** which seldom have to be adjusted (p. 30)

The original factory settings are restored in special maintenance (p. 29)

Directions for entering the maintenance mode are on page 21.



Press the button to move the cursor to "Settings". Press **OK.**



Press the button to move the cursor to the setting whose value you want to change. Press **OK.**
Press the **-** or **+** button to change the setting. Press **OK.**

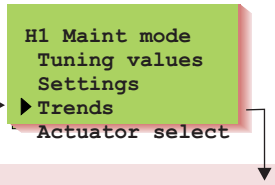
INFORMATION ABOUT MAINTENANCE MODE SETTINGS:

Settings:	Factory settings:	Range:	Explanation:
OutdoorDelay	2 h	0...10h	The length of the outdoor temperature measurement follow-up period from which the regulator calculates the average. Supply water regulation and pump control occur on the basis of the measurement of the average.
Pre-increase	0 h	0...5h	The duration of the automatic pre-increase after the reduced operation mode.

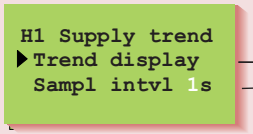
TRENDS

Directions for entering the maintenance mode are on page 21.

It is possible to follow supply water temperature changes on the trend display with the graphic depictor. You can decide yourse lf how often the temperature is measured. The factory set sampling interval is 1 second.

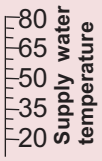


Press the button to move the cursor to “Trends”. Press **OK.**

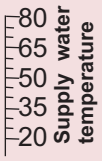


If you want to see the supply water temperature depictor, press **OK.**

You can read supply water temperature changes graphically.
A supply water temperature scale is printed on the right edge of the display. The exact temperature of the supply water also appears as a numerical value.

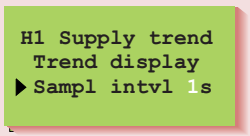


If a 3-point actuator is being used, the direction the actuator is being run can be seen on the display. The + character indicates that the actuator is being run into an open position. The - character indicates that the a ctuator is being run into a closed position.



If a voltage ontrolled actuator (0...10V or 2...10V) is being used, the actuator's position information can be seen on the display. (0% = closed, 100% = open).

Exit with **ESC.**



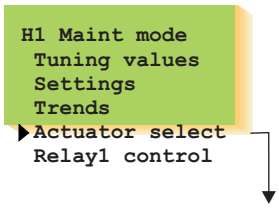
If you want to change the sampling interval, press the button to move the cursor to "Sampl intvl".
Press **OK.**
The time blinks. Press the **-** or **+** button to set the time.
Press **OK.**

Group select button - not in use in EH201/L
Browse button - moves the cursor up and down
ESC - press to return to the previous display
Info button - gives operating instructions

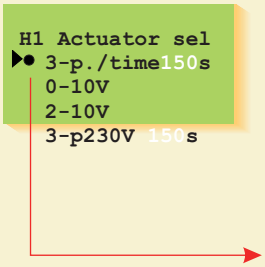
ACTUATOR SELECTION

Directions for entering the maintenance mode are on page 21.

The control mode for regulating circuit actuator is selected in actuator selection. Options are either 24 VAC 3-point control or DC voltage control (0...10V or 2...10V). If relays 1 and 2 are free, they can be utilized to implement 230VAC 3-point control. (first choose "230V Actuator" for the relay control mode. (See pages 26 - 28)



Press the button to move the cursor to “Actuator select”. Press **OK.**

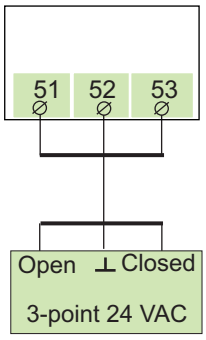


Press the button to move the cursor to the actuator control mode that you want to use.
Press **OK.**

If you select the 3-point control mode, the regulator asks for the actuator's running time. The running time indicates how many seconds go by if the actuator drives a valve nonstop from a closed position to an open position.
Press the **-** or **+** button to set the time. Press **OK.**
The ● character indicates which control mode is being used.

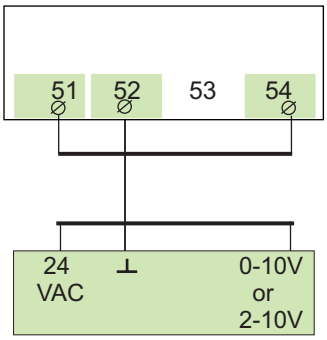
VALVE ACTUATOR CONNECTION:

3-point controlled actuator (24VAC)



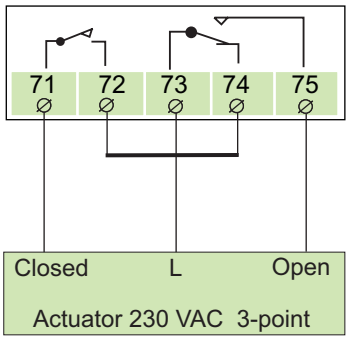
H1 actuator
(control output M1)

0...10V or 2...10V DC controlled actuator (24VAC)



H1 actuator
(control output M1)

3-point controlled actuator (230 VAC)



Ouman M31C150

Ouman M41A15

Attention! If "230V actuator" has been selected for relays 1 and 2, 230VAC 3-point controlled actuator can be connected to the regulator. Selection of relay control modes is shown on pages 26 - 28.

RELAY 1 CONTROL SELECTION

EH-201/L has two 230VAC/6A relays. Relay 1 is a break before make contact relay and relay 2 is an on/off relay. The relays can be used for many different purposes. If the relay has been selected for time control use, it can be labeled according to its use using the text editor (e.g., sauna, outside door etc.). Relays are time controlled in the regulator's clock functions (p. 14 - 15). A GSM phone can be used to bypass a relay's time program and the relay can be timer controlled or set in a continuous ON or OFF mode.

Directions for entering the maintenance mode are on page 21.

```
H1 Maint mode
 Tuning values
 Settings
 Trends
 Actuator select
▶Relay1 control
 Relay2 control
```

Press the ↕ button to move the cursor to “Relay1 control”. Press **OK.**

```
 Relay1 ctrl sel
▶● Not in use
   Pump sumr stop
   Time program
   Time/Outd.temp
   230V actuator
   GeothHeatFull
   GeothHeatPart
   Burner control
   Temp operated
```

Press the ↕ button to move the cursor to the control mode that you want to use. Press **OK.**
The ● character indicates which control mode is being used.

```
Pump sumr stop
▶ H1 Valve regul
 ●H1 Valve close
```

Pump summer stop: For each individual regul. circuit, select whether the valve will continue regulating or whether the valve will close when the pump stops. When you exit from this mode the regul. asks for the outdoor temp. at which the regulator stops the pump. The outdoor temp. limit can also be adjusted in settings, p. 6-8 pump stop.

```
Name change
▶ R1 Control
  Give new label
```

Time controlled relay: You can label the relay according to its use. Move the cursor to: Give new label and press **OK.** Use of the text editor is presented on page 9.

```
R1 Time/Outd.t.
▶ Outd.t.lim-15°C
```

Time and temperature controlled relay: Set the outdoor temperature (when the temp. drops) at which the clock is prevented from effecting relay 1's function. The outdoor temperat. limit can also be set in special maintenance settings

```
GeothHeatFull °C
▶ GeothH.UpPart55
  GeothH.UpHyst 6
  GeothH.LowMin35
  GeothH.LowHyst3
```

Full effect geothermal heating: The factory setting for the temperature of the accumulator (measurement 10) is 55°C (setting range 5 ... 55°C). The factory setting for the control's hysteresis is 6°C (setting range 3 ... 10°C).

```
GeothHeatPart °C
▶ GeothHeatAcc.55
  M9  Hysteres 3
  M10 Hysteres 3
```

Limited effect geothermal heating: The factory setting for the temperature of the accumulator's upper portion (meas. 9) is 55°C (setting range 5 ... 70°C). The factory setting is 3°C for the control's hysteresis of both the temperature of the accumulator's upper portion (meas. 9) and lower portion (measurement 10). (Setting range measurement 9: 3 ... 10°C and meas. 10: 3 ... 5°C).

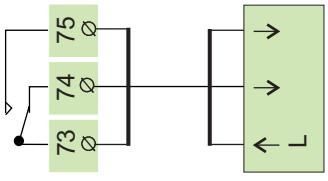
```
Burner control°C
▶ Burner ON   70
  Hysteresis   5
```

Burner control: The factory setting at which the burner starts up is 70°C (setting range 5…95°C) and the hysteresis is 3°C (setting range 1…20°C)

```
R1 Temp. lim.
▶ Setting   55°C
  Hysteresis 3°C
```

Temperature controlled function: The factory setting for measurement 11 in temp. controlled functions is 55°C (setting range 0...100 °C) and the hysteresis is 3°C (setting range 1 ... 10°C). The setting for measurement 11 can be adjusted either in this mode or on the user level (see p. 8, R1 temp lim.)

Connection information:



When the relay **is inactive** (timing program "OFF" mode or no electricity to actuator) the space between contacts **73-74 is closed** in the relay.

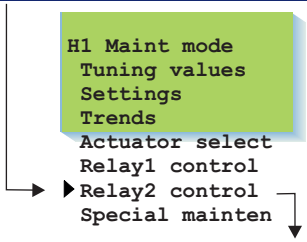
When the relay **is active** (timing program "ON" mode) the space between contacts **73-75 is closed** in the relay.

Group select button - moves you from one regulating circuit to the next
Browse button - moves the cursor up and down
ESC - press to return to the previous display
Info button - gives operating instructions

Add. inform. about relay 1 control

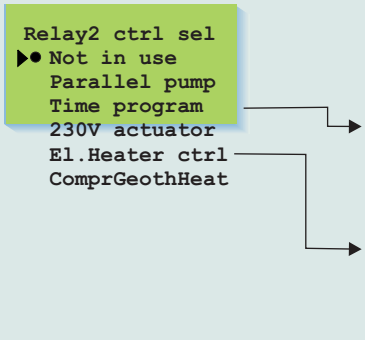
On the display:	Explanation:
Not in use	Relay 1 is not being used.
Pump sumr stop	The pumps stop (relay 1's space 73 and 74 opens) and the selected valves close when the outdoor temperat. is warmer than the "Pump stop" setting. During a stop period the regulator starts the pumps for a few minutes every day to prevent them from getting stuck (interval use).
Time program	The regulator time controls any electric apparatus using the relay, eg. a sauna stove, door locks. Timing programming is done in clock functions (p. 15). In the timing program's "ON" mode the relay is activated. The control mode can also be changed using a GSM telephone (see p. 20).
Time/Outd. Temp	The regulator controls relay 1 by time. In the "ON" mode the relay is activated. The "ON" mode is prevented if the outdoor temperature is colder than the relay 1's set outdoor temperature limit. (See p. 30). Timing/ outdoor temperature control is suitable for exhaust fan control Control → 73 → 75 — 1/1 speed ("ON" mode) 74 — ½ speed ("OFF"-mode)
230V actuator	When you have reserved relay 1 for 230V actuator control, the regulator automatically also reserves relay 2 for 230V actuator control if relay 2 is free. If relay 2 is not free, the regulator first requests to free relay 2 for 230V actuator control. After this you can begin using 230VAC 3-point control in the "actuator selection" mode (see page 25)
GeothHeatFull	When the control mode selected for relay 1 is "GeothHeatFull", the regulator automatically reserves relay 2 to control the compressor of the geothermal heating and reserves digital input 1 for geothermal heating selector switch position information (automatic position = strip connector 21-22 closed). Before selecting geothermal heating for relay 1, make sure that relay 2 is in a "Not in use" mode and the geothermal heating unit selector switch (start up / autom.) is connected to digital input 1 strip connectors 21 - 22. Relay 1 controls heating resistor. The regulator controls the compressor or the heating resistor according to the accumulator temperature set by the user. The compressor and heating resistor cannot be on at the same time. The heating resistor is switched on at the ["GeothHeatAcc." setting -hysteresis - 10°C] temperature (strip connector 73-74 closed). The heating resistor is switched off at the ["GeothHeatAcc." setting - hysteresis + 2°C] temperature (strip connector 73-75 closed).
GeothHeatPart	When the control mode selected for relay 1 is "GeothHeatPart", the regulator automatically reserves relay 2 to control the compressor of the geothermal heating and reserves digital input 1 for geothermal heating selector switch position information (automatic position = strip connector 21-22 closed). Before selecting geothermal heating for relay 1, make sure that relay 2 is in a "Not in use" mode and the geothermal heating unit selector switch is connected to the digital input 1 strip connectors 21 - 22 (start up / autom.). The regulator controls the compressor and heating resistor according to the accumulator temperature set by the user (see p. 8). The regulator also controls the compressor according to the temperature needed in the heating network. Relay 1 controls the heating resistor. Heating resistor is switched on at the ["GeothHeatAcc" setting - hysteresis - 3 °C] temperature (strip connector 73-74 closed). Heating resistor is switched off at the ["GeothHeatAcc." setting - hysteresis + 2°C] temperature (strip connector 73-74 open). The compressor and heating resistor can be on at the same time. The compressor's and heating resistor's control hysteresis is set in relay 1's control mode.
Burner control	The regulator controls the relay according to the boiler water temperature (meas. 10). The relay is activated at the setting (73-75 closed) and the burner starts up. The relay is released (73-74 closed) and the burner shuts off when the boiler water temperature reaches the "setting" + "hysteresis" temperature. The function can be selected when measurement 10 is connected.
Temp operated	The regulator controls relay 1 according to the temperature of measurement 11. The break before make contact relay is activated at the setting (73-75 closed) and released (73-74 closed) at the end of the set hysteresis (setting - hysteresis). E.g., a cooler's compressor or an accumulator's charging pump can be controlled with a temperature controlled relay. You can also adjust the temperature setting for measurement 11 on the user level (see p. 8)

RELAY 2 CONTROL SELECTION



Relay 2 is an on / off relay. The following functions can be implemented with relay 2:

1. Circulation pump control
2. Timing control
3. 230VAC actuator 3-point control (needs both relays)
4. Heating resistor control according to the temperature of meas. 10.
5. Geothermal heating unit compressor control if relay 1 is being used to control the geothermal heating unit.



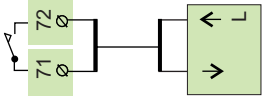
Press the button to move the cursor to the control mode that you want to use. Press **OK.** The ● character indicates which control mode is being used.

Time controlled relay: You can label the relay according to its use. Move the cursor to: Give new label and press **OK.** Use of the text editor is presented on page 9.

Switching the heating resistor on and off:
Relay 2 switches the heating resistor on and off according to the temperature of measurement 10. The factory setting at which the heating resistor switches on is 50°C (setting range 5…95°C) and the hysteresis is 5°C (setting range 1…10°C).

On the display:	Explanation:
Not in use	Relay 2 is not being used.
Parallel pump	If pump 1 stops (the thermal relay is triggered, see digital inputs p. 34-35), the regulator automatically connects the parallel pump (pump 2) and gives an alarm for pump 1. (Pump 2 control occurs through connectors 71 and 72.)
Time program	The regulator time controls any electric apparatus using the relay, eg. a sauna stove, door locks. Timing programming is done in clock functions (p. 15). In the timing program's "ON" mode the relay is activated. The control mode can also be changed using a GSM telephone (see p. 20).
230V actuator	When you have reserved relay 2 for 230V actuator control, the regulator automatically also reserves relay 1 for 230V actuator control if relay 1 is free. If relay 1 is not free, the regulator first requests to free relay 1 for 230V actuator control. After this you can begin using 230VAC 3-point control in the "actuator selection" mode (see page 25)
El.Heater ctrl	If EH-201/L is used for burner control (see p. 26-27), the regulator can also control the heating resistor according to the same measurement data (meas. 10). There is a separate setting for switching on the heating resistor. The heating resistor can be used as an extra source of heat or the main source of heat depending on whether the setting is higher or lower than the point at which the burner starts up.
ComprGeothHeat	When relay 1 has been selected for geothermal heating unit control, the regulator automatically reserves relay 2 to control the compressor of the geothermal heating unit. During **full effect geothermal heating** the compressor is switched on at the ["GeothHeatAcc." setting - hysteresis] temperature and then relay is activated (strip connector 71-72 closed). The compressor is switched off at the "GeothHeatAcc." setting temperature (see p. 8), and then the relay released (strip connector 71-72 open). The compressor is turned off and the heating resistor is switched on at the ["GeothHeatAcc." setting -hysteresis - 10°C] temperature (strip connector 73-74 closed). The heating resistor is switched off at the ["GeothHeatAcc." setting - hysteresis + 2°C] temperature (strip connector 73-74 open). During **limited effect geothermal heating** the compressor is turned on when the temperature of the accumulator's upper portion (meas. 9) drops to the ["GeothHeatAcc." setting - hysteresis] temperature and then relay is activated (strip connector 71-72 closed). The compressor is turned off at the "GeothHeatAcc." setting temperature and then relay released (strip connector 71-72 open). The regulator also keeps the temperature of the accumulator's lower portion (measurement 10) 5°C higher than the supply water temperature (measurement 2) determined by the regulator by turning the compressor on and off. Measurement 10 has fixed minimum and maximum limits (min. +35°C and max. +55°C).

Connection information:



When the relay is inactive (timing program "OFF" mode or no electricity to actuator) the space between contacts 71-72 is open in the relay.

Group select button - not in use in EH201/L

ESC - press to return to the previous display

Browse button - moves the cursor up and down

Info button - gives operating instructions

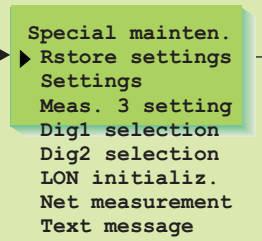
RESTORING SETTING

Restoring settings:

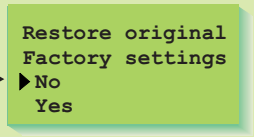
1. The regulator restores factory settings to the charasteristic heating curve settings.
2. Eliminates clock functions
3. Restores user and maintenance level settings
4. Selects automatic control for the operating mode
5. Selects the basic regulator for the regulator type.
6. Identifies the connected sensors and take into use regulating circuit.
7. Restores factory settings to the tuning values and trend sampling intervals.
8. Selects the 3-point control for actuator control which has a running time of 150s.
9. Relay controls are not in use.
10. Measurements are not read from the bus.
11. Erases the telephone number and restores the factory settings to the modem settings.

Directions for entering the maintenance mode are on page 21.

Original factory settings can be restored with the regulator in the following manner:



Press the ⇕ button to move the cursor to "Special mainten.".
Press **OK.**
The cursor is at "Rstore settings". Press **OK.**

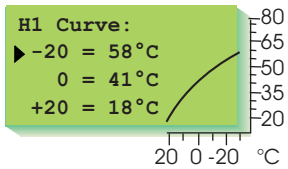


Restore original factory settings:

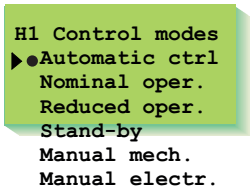
Press the ⇕ button to move the cursor to "Yes".
Press **OK.**

ORIGINAL FACTORY SETTINGS:

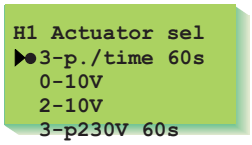
Characteristic heating curve:



Operating mode:

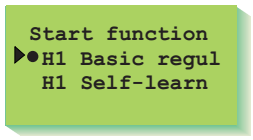


Actuator selection:

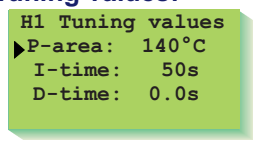


Settings:	Factory setting:
User level settings:	
Room temperature	21.5 °C
Temp. drop (supply water)	0 °C
Min. allowed supply water	15 °C
Max. alllowed supply water	70 °C
Room compensation ratio	4,0 °C
Wind compensation ratio	0 °C
Sun compensation ratio	0 °C
Pre-increase	0 °C
Autumn drying	2 °C
Valve close	30°C
Geothermal heating acculmul. temp.	55°C
Relay 1 temperature limit	55°C
Maintenance level settings:	
Outdoor temp. delay	2 h
Pre-increase	0 h
Special maintenance settings:	
Room temperature delay	0.5h
Return water maximum	70°C
Return water min. at 0°C	5°C
Return water min at -20 °C	15°C
Supply water min at 0°C	10°C
Supply water min at -20°C	30°C
The amount of deviat. from the H1/ R1 temp. operated supply water setting, which causes the alarm	75°C
The duration of the deviation that causes the alarm	60 min
Output limit	999kW
Water flow limiting function	99.9 l/s
½ exhaust	6°C
Relay 1 outdoor temperature limit	-15°C

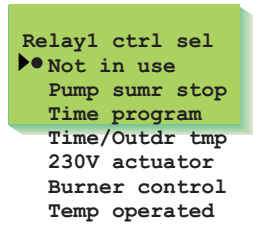
Start function:

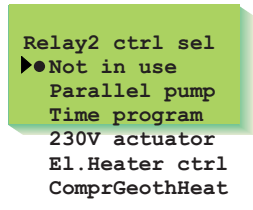


Tuning values:



Relays:

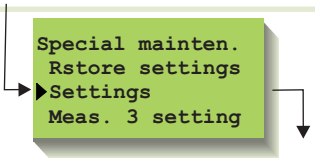




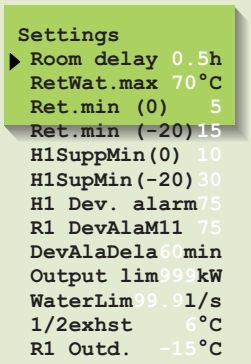
SETTINGS

In the Ouman EH-201/L heating regulator the user can adjust most of the settings (see settings p. 6-8). Some of the settings that control the regulator's functions can be set in the maintenance mode (see page 23) and some in special maintenance. Seldom needed settings can be adjusted in special maintenance.

Directions for entering the maintenance mode are on page 21.



Press the ↕ -button to move the cursor to "Settings".
Press **OK.**



Press the ↕ button to move the cursor to the parameter that you want to change. Press **OK.**

Press the **-** or **+** button to change the setting. Press **OK.**

INFORMATION ABOUT SPECIAL MAINTENANCE SETTINGS:

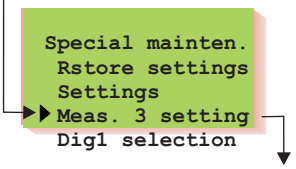
Settings:	Factory settings:	Range:	Explanation:
Room delay	0.5h	0...2	The average inside temperature measurement time which the room compensation uses.
RetWat. max	70°C	25...95	Return water maximum allowed temperature at which the regulator begins lowering the return water temp.
Ret. min (0°C)	5°C	5...20	Freeze protect limit. Minimum return water temperature when the outdoor temperature is 0°C.
Ret. min(-20°C)	15°C	10...50	Freeze protect limit. Minimum return water temperature when the outdoor temperature is -20°C.
H1 SuppMin (0°C)	10°C	5...20	Lower limit of supply water during a free temperature drop when the outdoor temperature is 0°C. (stand-by function)
H1 SuppMin(-20°C)	30°C	10...50	Lower limit of supply wate r during a free temperature drop when the outdoor temperature is -20°C. (stand-by function)
H1 Dev. alarm	75°C	1...75	H1 supply water temperature deviation from the setting determined by the regulator which causes th alarm
R1DevAlaM11	75°C	1...75	Temp. (meas. 11) deviation from the setting of "R1 Temp operated" which causes the alarm. This setting appears if "Temp operated" has been selected in the relay1 control mode (p. 26).
DevAlaDela	60 min	0...90	The alarm goes off if the deviation has lasted for the set time.
Output lim	999 kW	0...999	Maximum district heating water flow at which output limiting begins.
WaterLim	99.9 l/s	0.1...99.9	Maximum district heating output at which output limiting begins.
½ exhst	6°C	0...10	Drop in supply water temperature when the exhaust fan is at ½ speed.
R1 Outd.	-15°C	-30...+20	The outdoor temp. limit for relay 1 (in use when "time /outdoor temperature control has been selected for relay 1's control mode")

Group select button - not in use in EH201/L
Browse button - moves the cursor up and down
ESC - press to return to the previous display
Info button - gives operating instructions

MEASUREMENT 3 SETTING

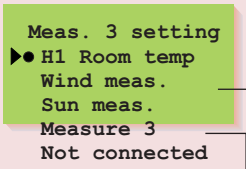
Directions for entering the maintenance mode are on page 21.

In this special maintenance mode, measurement 3 can be changed to just a free temperature measurement or wind or sun compensation measurement. The H1 room compensation is a factory setting. Free temperature measurement is labeled "Meas. 3". This label can be changed **using the text editor.**



Press the button to move the cursor to "Meas. 3 setting". Press **OK.**

Selecting measurement 3:



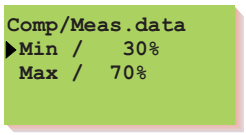
Press the button to move the cursor to what you want to connect to measurement 3. Press **OK.**

The ● character indicates which measurement has been chosen for measurement 3.

Setting limits for the wind or sun sensor measurement message:

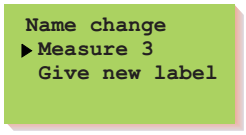
You must set compensation limits for wind or sun measurements. The minimum indicates where in the transmitter's measurement area the compensation begins and the maximum indicates at which measurement area the compensation is at maximum value.

More information about sun and wind sensor connection on the next page



Press **OK.**
Press the **-** or **+** button to set a limit and press **OK** to confirm.

Labeling measurement 3 using the text editor:

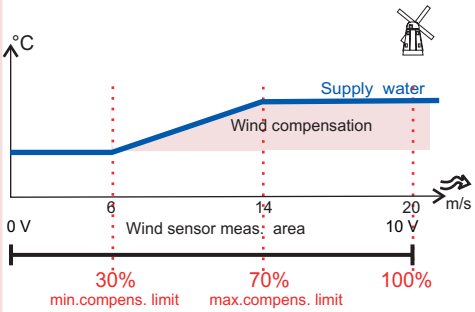


The factory setting for free measurement is labelled "Meas. 3".
Relabeling is shown on page 9.

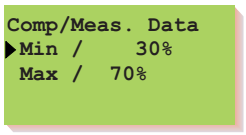
Measurement 3: Wind/ Sun meas

When you connect the wind or sun sensor to measurement 3, you instruct the regulator when you want the wind or sun compens. to function. Calculate compensation limits (min/max) in the same way regardless of which sensor is in use.
The wind and sun compensation ratio indicates how many degrees compensation changes the supply water temperature and the user can set this. (See settings p. 6-7).
The wind and sun sensor measurement signal can be 0...10 V, 2...10 V, 0...20mA or 4...20 mA. Adjust the sensors with the regulator's resistors so that the measurement message that comes from the regulator is always 0...5 V.

Compensation area calculation



Picture. Wind compensated supply water temperature curve.



Example: A wind sensor is in use which has a measurement area of 0...20 m/s. You want wind compensation to begin when the wind velocity is 6 m/s (min. limit) and compensation to be at maximum value when the wind velocity is at least 14 m/s (max. limit). Calculate how many percent the wind compensation limits (min. limit and max. limit) are from the measurement area' s maximum (=20 m/s), and set them as the minimum and maximum compensation percents.

$$\text{Min. compens.} = \frac{\text{Min.limit}}{\text{meas. area's max.}} \times 100\% = \frac{6\ \text{m/s}}{20\ \text{m/s}} \times 100\% = 30\%$$

$$\text{Max.compens.} = \frac{\text{Max limit}}{\text{meas. area`s max.}} \times 100\% = \frac{14\ \text{m/s}}{20\ \text{m/s}} \times 100\% = 70\%$$

If measurement sensors that begin from zero are in use, (0...10V or 0...20mA) set the values calculated with the above formula as the minimum and maximum compensation percents.

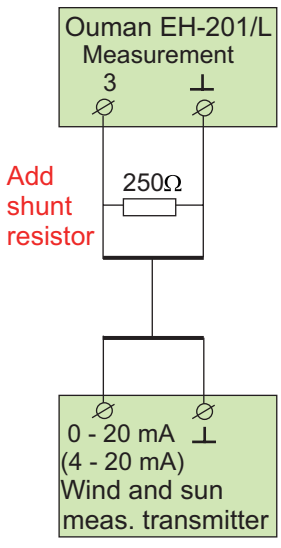
Setting the min. and maximum compens. when the sensor's measurem. area does not begin at zero.

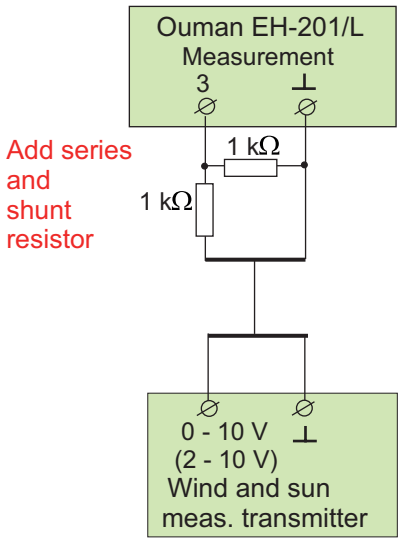
Value obtained from the formula	2-10V 4 -20 mA
10 %	→ 28 %
20 %	→ 36 %
30 %	→ 44 %
40 %	→ 52 %
50 %	→ 60 %
60 %	→ 68 %
70 %	→ 76 %
80 %	→ 84 %
90 %	→ 92 %
100 %	→ 100 %

1. Calculate the compensation percents with the "min. compens." and "max. compens." formula.

2. See which values should be set for the regulator from the equivalency table.

Wind or sun sensor connection:



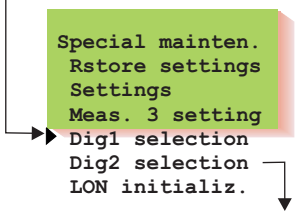


DIGITAL INPUTS 1 AND 2

EH-201/L has two digital inputs. They can be used either for receiving alarms, receiving information about exhaust fan running at ½ speed, receiving a temperature drop command from the home / away switch, or receiving information about running circulation pump 1 (if pump 1 stops the regulator can be programmed to start a parallel pump). District heating energy and water meter pulses can also be connected to digital inputs.

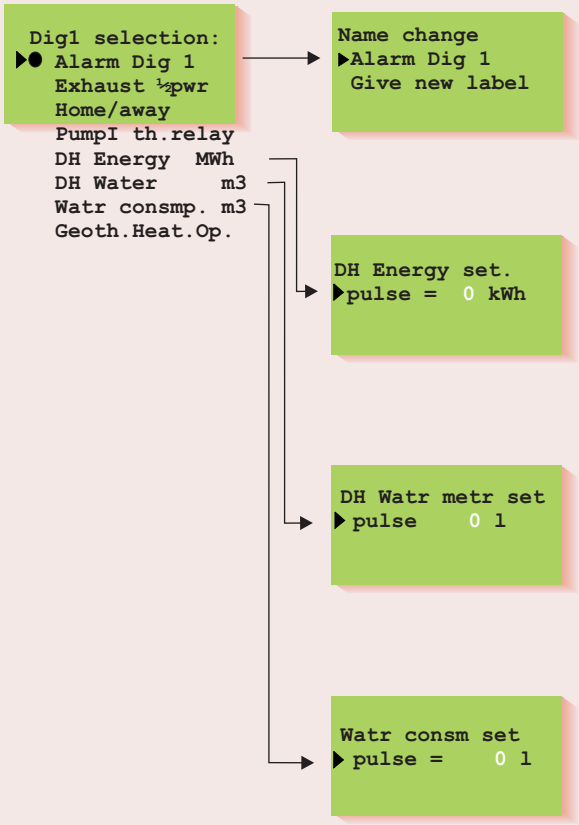
If relay 1 has been reserved for geothermal heating unit control, the geothermal heating unit selector switch (start up / automatic) is connected to digital input 1 (strip connector 21-22).

Directions for entering the maintenance mode are on page 21.



Press the button to move the cursor to"Dig 1 or Dig 2 selection". Press **OK.**

Press the button to move the cursor to indicate which information has been connected to the Dig channel in question. Press **OK.** The ● character indicates the selection made.



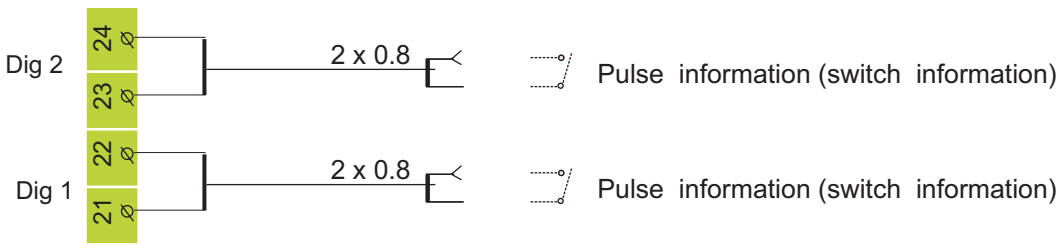
Alarm use: Alarm switch information. When the switch is closed, an alarm goes off. You can use the text editor to label the alarm, e.g., Order oil! (see p. 9). In the event of an alarm, the regulator sounds the alarm and indicates on the display from which digital input the alarm came from. Transferring the alarm to a GSM phone (see p. 39).

Pulse information from the district heating energy meter: Press **OK**. Set the number of kWh equivalent to one pulse and press **OK**. District heating energy consumption (MWh) and the momentary (5 min. follow-up period) district heating power consumption (kW) can be seen on the regulator's measurements display.

Pulse information from the district heating water meter: Press **OK**. Set the number of liters equivalent to one pulse and press **OK**. District heating water consumption (DH m3) and the momentary district heating water consumption (Inst. l/s) can be seen o the regulator's measurements display.

Pulse information from the facility's water meter: Press **OK**. Set the number of liters equivalent to one pulse and press **OK**. The facility's water consumption (Water m3) can be seen on the regulator's measurements display.

Connection guide:



Addit. inform. about digital inputs

On the display:	Explanation:
Alarm Dig 1	Alarm switch information. When the switch is closed an alarm goes off.
Exhaust ½pwr	Exhaust fan ½ speed information. When the switch is closed the exhaust fan is at ½ speed. The information is used to lower the heat when the exhaust fan is at ½ speed. The amount of the drop is given in special maintenance settings. (p. 28, ½ exhst)
Home/away	Away switch information. (switch closed, reduced temperature mode is on).
Pump1 th.relay	Pump 1 thermal relay switch information. When the switch is closed pump 1 does not run. In that case the regulator starts the parallel pump and gives an alarm if r elay 2 is connected to alarms.
DH Energy MWh	Pulse information from the district heat energy meter.
DH Water m3	Pulse information from the district heat water meter (m^3).
Watr consmp. m3	Pulse information from the facility water meter (m^3).
GeothHeatCtrl	When relay 1 is used for geothermal heating control, the geothermal heating selector switch (start up / automatic) is connected to strip connectors 21-22 (see pages 26 - 27). When **starting up** the switch opens the dig 1 space. In automatic position strip connector 21 - 22 is closed. Select full effect or limited effect geothermal heating in relay 1 control selection and after this selection you can change the settings that switch the compressor and heating resistor on and off.

Additional information about geothermal heating:

A. Full effect geothermal heating:

Start up: The geothermal heating unit's accumulator is heated to the "Accumulator." setting temperature with the help of the compressor. The heating resistor cannot be on. Position of the geothermal heating unit selector switch: Start up (the switch opens the dig 1 space)
Automat function: The EH-201/L regulator attempts to keep the temperature of the accumulator at the "Accumulator" temperature (meas.10) set by the user by controlling the compressor or heating resistor following manner:

Function and temperature limits	The state of relay	Strip connector
Compressor is switched on, when -the accumulator's temp. drops to the ["GeothHeatAcc" setting - "Hysteresis"] temperature	relay 2 is active	71-72 closed
Compressor is switched off, when - the accumulator's temperature rises to "GeothHeatAcc" (measurement 10) temperature	relay 2 is inactive	71-72 open
Compressor is switched off and heating resistor is switched on, when the accumulator's temp. drops to the ["GeothHeatAcc" setting - "Hysteresis" - 10 °C] temp. The accumulator`s temp has to stay 20 min under this level before the heating resistor is switched on	relay 2 is inactive relay 1 is inactive	71-72 open and 73-74 closed
Heating resistor is switched off, when the accumulator's temp. rises to ["GeothHeatAcc" setting - "Hysteresis" + 2°C] temperature	relay 1 is active	73-74 open

B. Limited effect geothermal heating:

Start up function works same way than automat function, but heating resistor is not able to switched on.
Automat function: The compressor can switch on according the accumulator upper part temperature (meas. 9) or accumulator lower part temperature (meas. 10) if the temperature of the accumulator lower part is under 55°C (maximum allowed accumulator lower part temperature). The heating resistor also switched on according t the temperature of accumulator upper part (measurement 9), if the effect for the compressor is not sufficient.

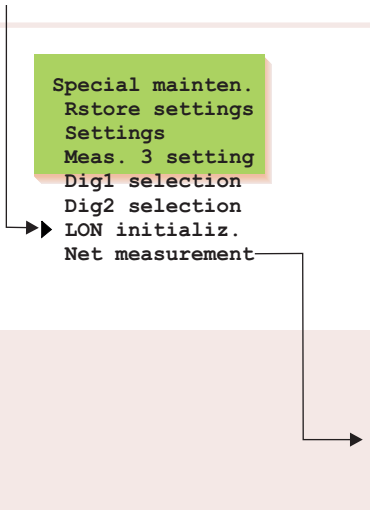
Functions and temperature limit s	The state of relay	Strip connector
Compressor is switched on, when - the accumulator's upper part temp. drops to ["GeothH.UpPart" setting - "GeothH.UpHyst"] or - the accumulator's lower part temperature drops to ["Supply water temperature determined by regulator" + 5°C - "GeothH.LowHyst"] or - the accumulator's lower part temperature drops to "GeothH.LowMin"	relay 2 is active	71-72 closed
Compressor is switched off, when - the accumulator's upper part temperature reach "GeothH.UpPart" (meas. 9) **and** - the accumulator's lower part temp. reach ["Supply water temp. determined by regulator" + 5°C] **and** - the accumulator's lower par t temperature is over ["GeothH.LowMin" + "GeothH.LowHyst"] **Compressor is <u>always</u> switched off,** when - the accumulator's lower part temp. rises to 55°C (accumulator's lower part max. allowed temp.)	relay 2 is inactive	71-72 open
Heating resistor is switched on, when - the accumulator's upper part temp. drops to ["GeothH.UpPart" setting - "GeothH.UpHyst" - 3 °C]	relay 1 is inactive	73-74 closed
Heating resistor is switched off, when - the accumulator's upper part temp. reach ["GeothH.UpPart" setting - "GeothH.UpHyst" + 2 °C]	relay 1 is active	73-74 open

Group select button - not in use in EH201/L
Browse button - moves the cursor up and down
ESC - press to return to the previous display
Info button - gives operating instructions

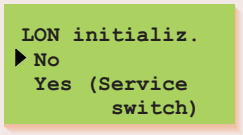
LON INITIALIZING

Ouman EH-201/L has an LON-200 adapter card (optional equipment) (contains an FTT-10A bus adapter) which makes it possible to connect the regulator to an LON field bus. In this special maintenance mode you can control the Neuron processor's service pin which is on the LON-200 card so that the Neuron sends the bus its own identification (48 bit Neuron ID). This procedure is necessary when initializing EH-201/L + LON-200 into the facility's LON net.

Directions for entering the maintenance mode are on page 21

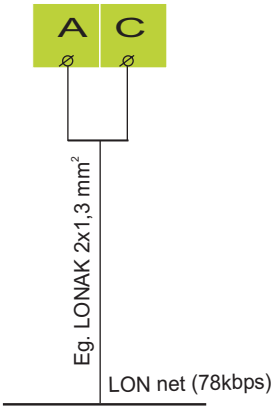


Press the button to move the cursor to "LON initializ.". Press **OK.**

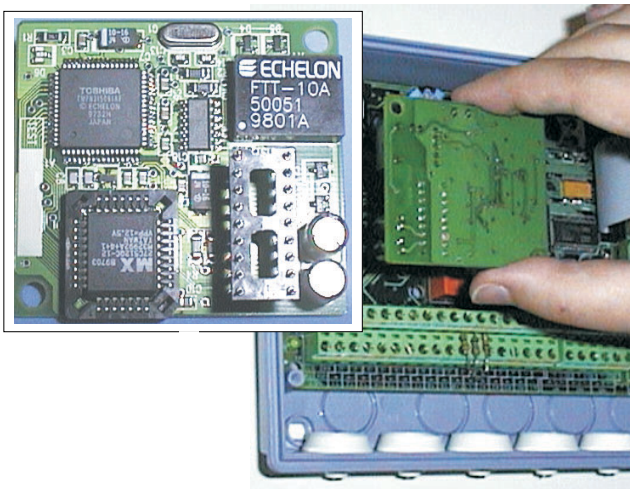


Press the button to move the cursor to"Yes (Service switch)". Press **OK.**

Connection guide:



LON-200 adapter card

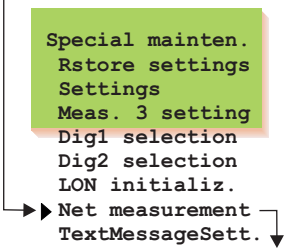


An installation guide comes with the LON-200 adapter card.

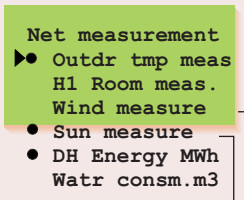
NET MEASUREMENT

Ouman EH-201/L has an LON-200, EH-485 and MODBUS-200 adapter card (optional equipment). In this special maintenance mode you can select which measurement information is to be read from the net.
If you selected to read wind or sun measurements from the net, you must set the compensation area in this mode.

Directions for entering the maintenance mode are on page 21.



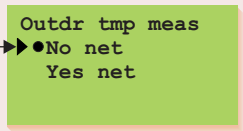
Press the ▲▼ button to move the cursor to "Net measurement".
Press **OK.**



Browsing the net measurements:

By using the ▲▼ button to browse, you can see which measurements car be read from the net.

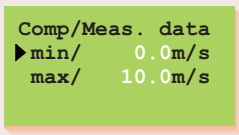
Setting net measurements:

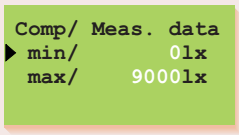


Move the cursor to the measurement you want and press **OK.**
If you want to select an serial interface for the measurement in question, move the cursor to Yes net and press **OK.** The ● character indicates that the measurement information is read from the net.

Setting wind or sun measurements (net):

You must set the compensation limits for wind and sun measurements. The minimum indicates when compensation begins and the maximum indicates when compensation is at a maximum value. Set the limits for wind measurement as wind speed (m/s) and for sun measurement as amount of light (lx).





Setting limits:
Press **OK.**
Press the **-** or **+** button to set the limit and confirm by pressing **OK.**

Attention! Set wind and sun compensation in "Settings" (see page 6-7).

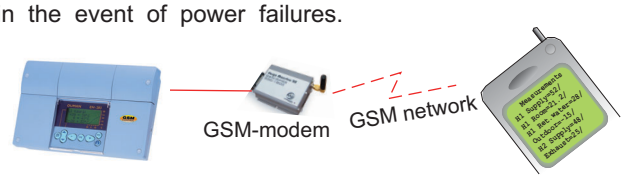
Group select button - not in use in EH201/L
Browse button - moves the cursor up and down
ESC - press to return to the previous display
Info button - gives operating instructions

MODEM SETTING (TEXT MESSAGE CONNECTION)

Directions for entering the maintenance mode are on page 21.

```
Special mainten.
 Rstore settings
 Settings
 Meas. 3 setting
 Dig1 selection
 Dig2 selection
 LON initializ.
 Net measurement
▶Text message
```

In order to communicate via text messages, the regulator must be connected to a GSM modem (optional equipment). The modem comes with an adapter cable equipped with a D-connector that is used to connect modem to the regulator. The regulator's strip connector B-D space is connected with a jumper wire. GSM modem connection is done in start functions. The regulator automatically initializes the GSM mode in two hour intervals. This prevents the GSM from becoming disconnected in the event of power failures.




```
Modem connect
 Data link
▶Text message
```

The regulator's strip connector B-D space is connected with a jumper wire.

Press the ▲▼ button to move the cursor to "Text message". Press **OK.**

```
TextMessageSett.
▶Alarm GSM1 nr
 Alarm GSM2 nr
 Device ID
 MessageCentreNr
 PIN-code
 Modem type
```

Installing receivers for alarm messages:

Give a telephone number that the regulator automatically sends a text message to about an alarm in the event of an alarm. At first the alarm message is only sent to the GSM number 1. If the alarm is not acknowledged from this number, after five minutes the regulator sends a new alarm to both the GSM 1 and 2 numbers.

```
Telephone nr.
▶
 Change
```

Press the ▲▼ button to move the cursor to "Change". Press **OK**. "O" blinks. Write the telephone number using the text editor. You can move forward or backward in the character row with the **+** or **-** button. Confirm the number by pressing **OK**, then the same number that you selected will blink in the next space. Whichever has been selected last can be deleted by pressing **ESC**. If you press the **ESC** button for a while, the number will be deleted and the number that was previously fed will remain in effect. When you are ready, press **OK** for a while (over 2 secretary.).

Device ID:

The regulator can be given a device ID, which functions as the device's secret password and address information. The device ID can be freely labeled. The device ID is always written in front of the keyword when using the GSM to communicate with the regulator.

```
Device ID
▶ Not in use
  In use    0000
```

Move the cursor to "In use". Press **OK**. "0" blinks. Write a device ID that has a max. of 4 characters. The text editor has the letters A…Z and the numbers 0…9. You can move forward or backward in the character row by pressing the **+** or **-** button. Confirm the character by pressing **OK**.

```
Telephone nr.
▶
 Change
```

Installing the number for the message center:

Give the operator-specific message center number with **+** or **-** button. Confirm by pressing **OK**.

```
PIN-code
▶----
 Change
```

Installing the modem's PIN for the regulator:

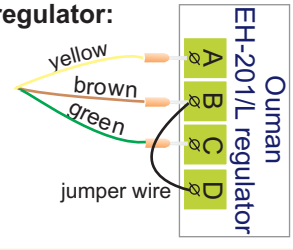
Give the SIM card's PIN code. The regulator will not initialize the GSM modem before the PIN code is installed. The SIM card has to be put in the GSM telephone to change the modem's PIN code. When you have changed the PIN code, install the SIM card back in the modem.

```
Modem type
 Falcom A2D
 Siemens M20T
▶Ouman/Fargo
```

Selecting the modem type:

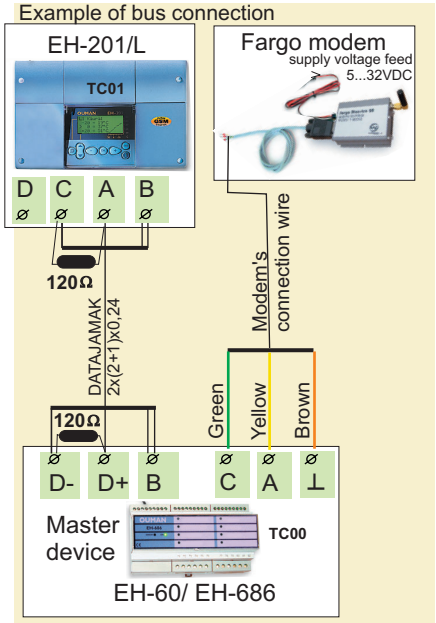
EH-201/L is compatible with Falcom A2D and Siemens M20T modems.

Connecting the GSM modem's D-9 con nector to the EH-201/L regulator:

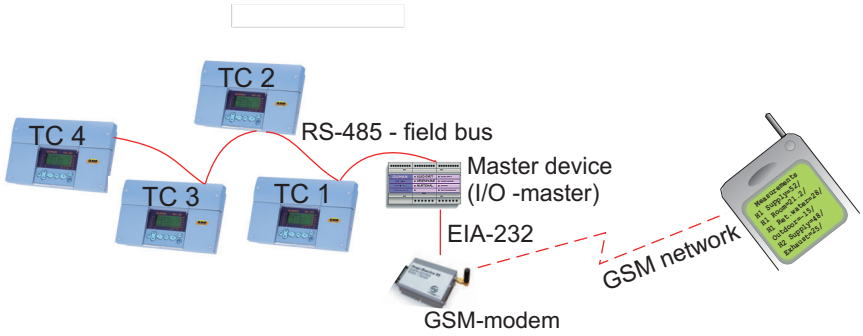


TEXT MESSAGE SETTINGS (NET SOLUTION)

Example of bus connection



That which is presented on this page is in effect when a modem has not been directly connected to the regulator. Communication occurs through the regulator's RS-485 field bus. Many regulators can be connected to the system by using the EH-485 bus adapter card and connecting a GSM modem to the field bus through the master device, EH-686.
Regulators that are connected to the bus will be given a device ID (e.g., TC 1) so the system will identify which regulator is being communicated with. The device ID always has to be written in front of the keyword when communicating with the regulator.



Directions for entering the maintenance mode are on page 21.

```
Special mainten.
 Rstore settings
 Settings
 Meas. 3 setting
 Dig1 selection
 Dig2 selection
 LON initializ.
 Net measurement
▶ Text message
```

Press the ↕ button to move the cursor to "Text message".
Press **OK.**

```
TextMessageSett.
▶ Alarm GSM1 nr
 Alarm GSM2 nr
 Device ID
```

Installing receivers for alarm messages:

A GSM telephone can receive alarms and also acknowledge them. A telephone number is given here that the regulator automatically sends a text message to about an alarm in the event of an alarm.
At first the alarm message is only sent to GSM number 1. If the alarm is not acknowledged from this number, after five minutes the regulator sends a new alarm to both GSM numbers 1 and 2

```
Telephone nr.
▶
 Change
```

Press the ↕ button to move the cursor to "Change". Press **OK**. "O" blinks. Write the telephone number using the text editor. You can move forward or backward in the character row with the **+** or **-** button. Confirm the number by pressing **OK**, then the same number that you selected will blink in the next space. Whichever has been selected last can be deleted by pressing **ESC**. If you press the **ESC** button for a while, the number will be deleted and the number that was previously fed will remain in effect. When you are ready, press **OK** for a while (over 2 secretary.).

Installing the device ID:

When an RS-485 field bus is used for text message connections, the regulators are identified using a device ID. The device ID which is 4 characters long and can be freely labeled using the text editor functions as address information. The device ID is given as follows.

```
Device ID
▶ Not in use
  In use   0000
```

Move the cursor to "In use". Press **OK**. "0" blinks. Write a device ID that has a max. of 4 characters by pressing the **+** or **-** button. Confirm the character by pressing **OK**.

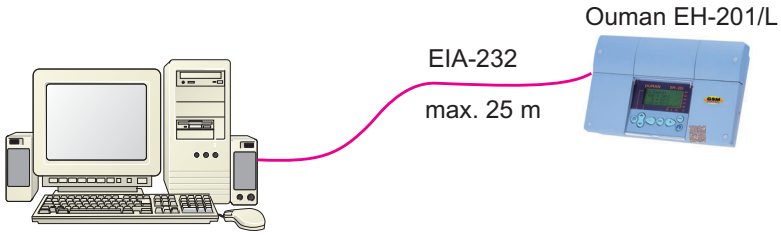
OUMAN®

Group select button - not in use in EH201/L
Browse button - moves the cursor up and down
ESC - press to return to the previous display
Info button - gives operating instructions

Direct computer connection

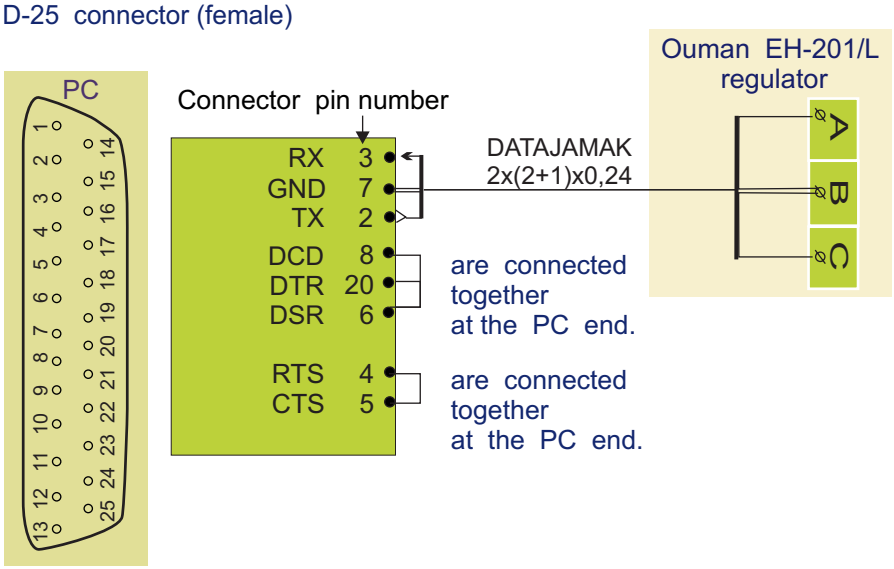
The Ouman EH-201/L regulator can be connected directly to a computer.

DATAJAMAK cable is used to make the connection.
Attention! If there are interferences in data transfer, try connecting the cable cover to the D-25 connnection pin no. 1 (protective GND).

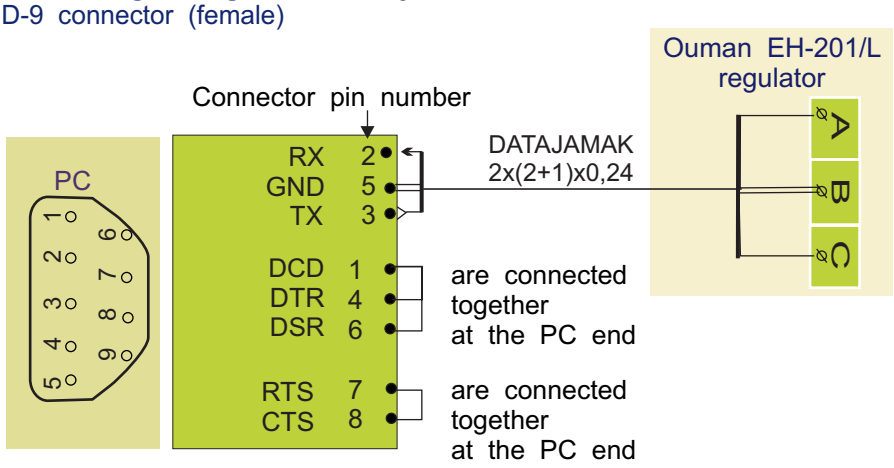


Connection guide:

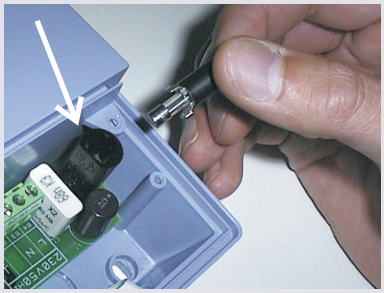
Connecting the regulator directly to a PC:
D-25 connector (female)



Connecting the regulator directly to a PC:
D-9 connector (female)

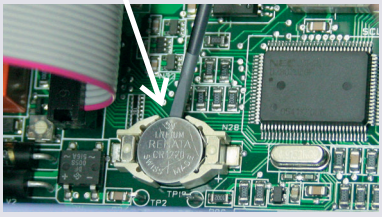


Changing the fuse:



Switch off the voltage from the regul. Press the fuse socket and turn it counter clockwise. Change the 160mA (5x20mm) glass tube fuse. Press and turn the fuse socket clockwise into place.

Changing the battery:



EH-201/L has a backup that saves the time and time program in case of a short power failure. If the time is not correct after the power failure, the battery must be changed. Battery type: Lithium button battery CR 1220, 3V. Unfasten the regulator's fuse (see the topmost picture). Carefully pry the old battery from its holder, for eg., with a thin screw driver. Push the new battery into the holder with the + end up. The old battery can be put into the garbage.

Spacers:

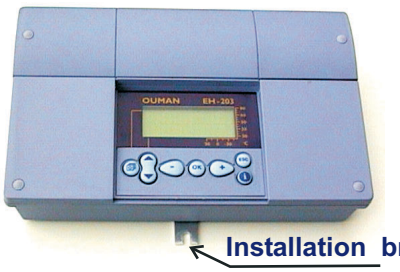
The cables can be routed between the regulator and installation base when spacers are used to mount the regulator.

Plugs:

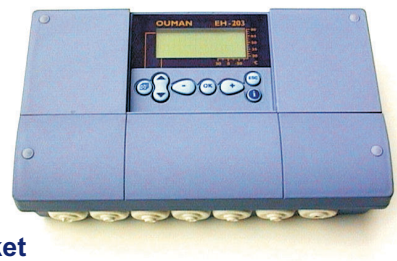
Complete installation by pressing the plastic plugs into the screw holes.

EH-201/L is fastened to its mounting base with three screws (two mounting points under the cover in the connection space and one in the installation bracket. Cables can be brought for the regulator from above (standard factory delivery) or from below. In addition, there are 6 cable through-holes in the bottom of the regulator case which can be opened, e.g., with a screw driver. Then the cables can be brought into the connection space through the bottom.

Cabling from above:
(standard factory delivery)



Cabling from below:
(turn the keyboard/display unit)

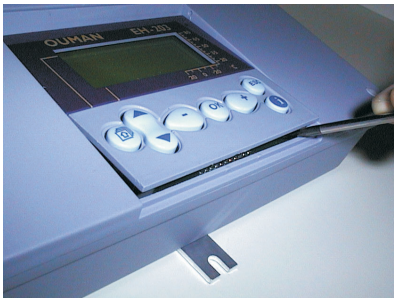


Mounting guide:
Screw the regulator to the wall using the installation bracket. Position the unit so it is level. Screw the regulator firmly into place using two screws through the connection space.

If you want to bring the cables to the regulator from below, you must turn the keyboard / display unit according to the following instructions.

Changing the cabling direction:

Remove the clear cover. Press as illustrated in the picture and pull the cover out of place.

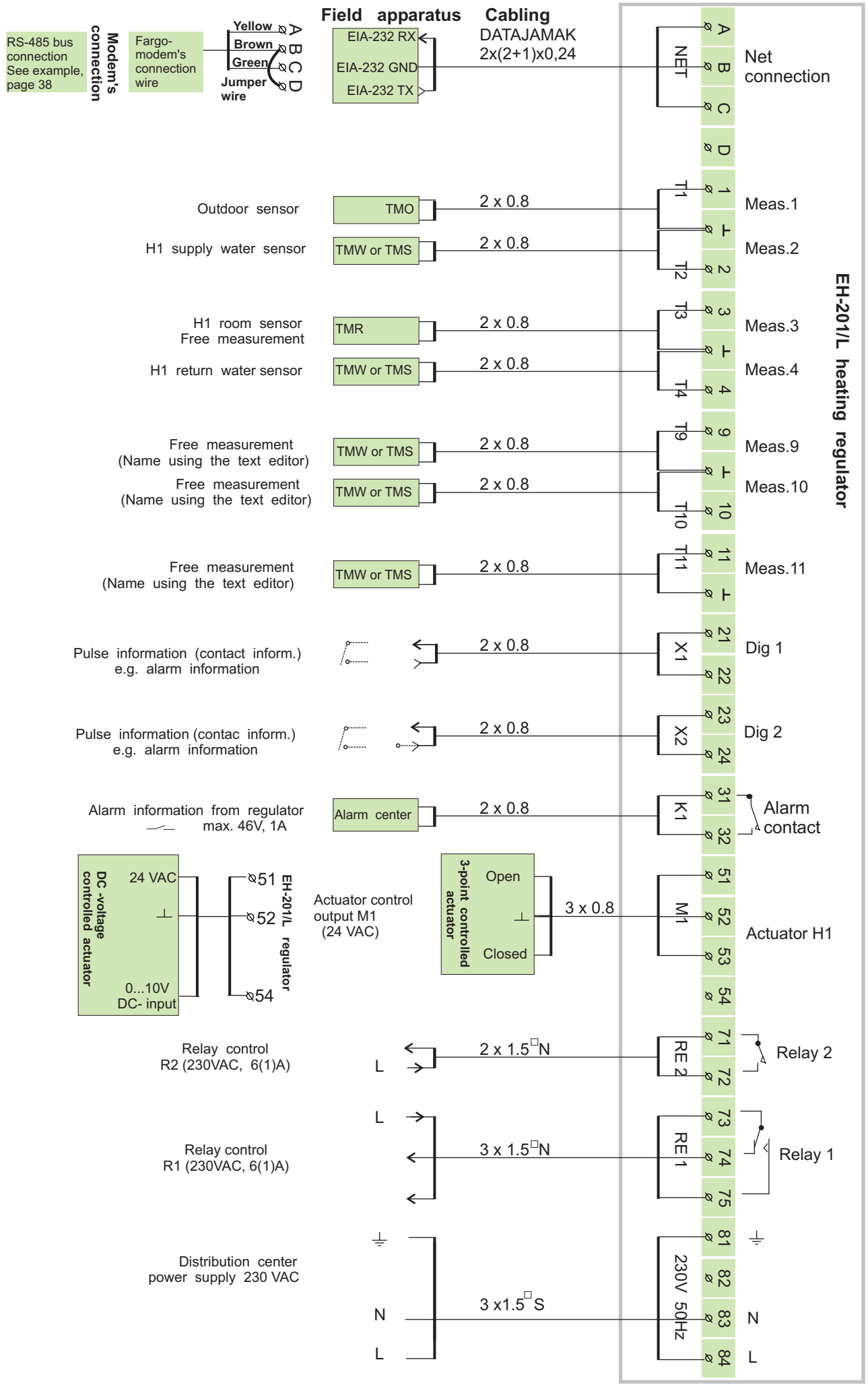


Detach the keyboard / display unit carefully by prying it with a screwdriver.

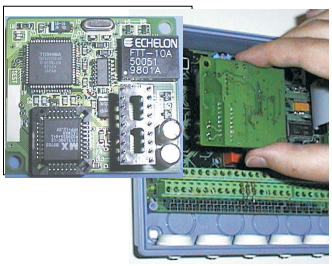
Turn the keyboard / display unit into the opposite position.

Press the keyboard / display unit carefully into place.

OUMAN EH-201/L GENERAL CONNECTION DIAGRAM

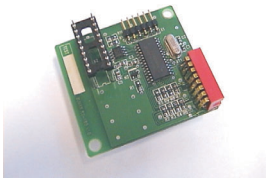


OPTIONAL EQUIPMENT



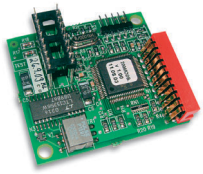
LON-200

LON -200 is an adapter card which changes the EH-200 series regulators' serial communication bus so it is compatible with the LON field bus. An installation guide comes with the LON-200 adapter card.



EH-485

Ouman has an EH-485 bus adapter card available as optional equipment which makes the EH-201/L interface compatible with the RS-485 field bus. This offers the choice of economically connecting the EH-201/L regulators to the monitor unit.

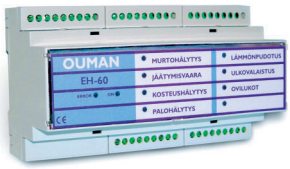


MODBUS-200

MODBUS-200 is a bus adapter card which makes the EH-201/L interface compatible with the MODBUS RTU field bus. The physical interface to the field bus is galvanically isolated RS-485 network.

GSM-modem

When a GSM modem is connected to the regulator, a GSM telephone can be used to communicate with the regulator via text messages.



EH-686

An input/output unit which contains relays, analog and digital inputs as well as analog outputs. The unit makes it possible to carry out time controlled relay functions, transfer alarms using digital inputs and make an individual regulating circuit. EH-686 can also function as a master in the Ouman RS-485 bus by directing traffic in the net.

PAN-200

With the help of panel installation kit PAN-200 the regulator EH-201/L is easy to install for example to the control cabin. The size of the installation hole is 222 mm x 138 mm.

Group select button - moves you from one regulating circuit to the next

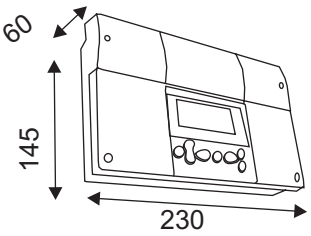
Browse button - moves the cursor up and down

ESC - press to return to the previous display

Info button - gives operating instructions

INDEX

Technical information:

Operat. voltage:	230 VAC, 50 Hz, 0.16 0mA
Casing:	PC/ ABS
Protection class:	Without cover seal IP 41
Measurements (mm):	
Weight:	1.1 kg
Cabling direct.:	From above or below (turnable display and keyboard). Through holes on the bottom.
Regulator type:	PID
Measurements:	7 pieces (NTC 10 kΩ)
Clock programs:	max. 7 program phases / H1 regulating circuit max. 7 program phases/ relay (begins-ends = 1 program phase)

Digital inputs:	2 pieces The potential free contact is connected to the digital input (load 6...9 VDC / 20 mA)
Outputs:	1 actuator control outputs 3- point 24 VAC or voltage control (0...10 V or 2...10 V) Actuator's output power max. 19 VA
Relay outputs:	1 break before make contact relay 230VAC / 6(1)A and 1 norm. open contact relay 230 VAC / 6(1)A
Alarm relay outputs:	1 24 VAC / 1A
Information transfer connection:	EIA-232C, RS-485 or LON
Operating temp.:	0 … +50°C
Storing temperature:	-20 … +70 °C
Approvals:	
EMC-directive	89 / 336 / EEC, 92 / 31 / EEC
-Interference toler.	EN 50082 -1
-Interf. emissions:	EN 50081 -1
Small voltage direct.	73 / 23 / EEC
- Safety	EN 60730 -1
Warranty:	2 years
Manufacturer:	Ouman Finland Oy Voimatie 6, 90440 Kempele FINLAND Tel. + 358 424 8401 Fax. + 358 424 840 201 e-mail: ouman@ouman.fi www.ouman.fi

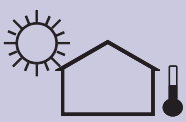
Regulation principles:

We reserve the rights to make technical changes.

Supply water regulation according to the outdoor temperature.

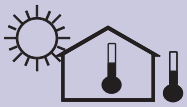
Supply water regulation according to the outdoor temperature, including the inside temperature measurement. (room compensation)

Supply water regulation according to the outdoor temperature, including wind compensation.

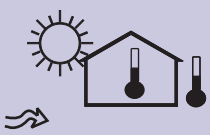


Supply water regulation according to the outdoor temperature, including sun compensation.

Supply water regulation according to the outdoor temperature, including the inside temperature measurement (room compensation) and wind compensation.



Supply water regulation according to the outdoor temperature, including the inside temperature measurement (room compensation) and sun compensation.



Supply water regulation according to the outdoor temperature, including the inside temperature measurement (room compensation) and both sun and wind compensation.